DAT226x

Creating a Master Data Solution with SQL Server Master Data Services

Lab 2-1 | Developing a Master Data Services Solution

Estimated time to complete this lab is 60 minutes

Overview

In this lab, you will develop a SQL Server 2016 Master Data Services solution to store and manage geographic master data.

This will involve using two tools to create and manage the solution. You will first use the MDS Add-in for Excel to create entities, and to also insert new members. You will then use the Master Data Manager Web application to create a business rule and a derived hierarchy. Lastly, you will continue to use the Master Data Manager Web application to explore, review and maintain members.

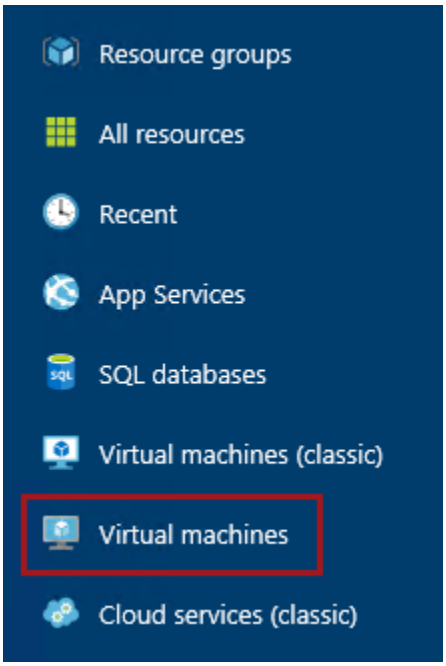
Note: The three labs in this course are accumulative. You cannot complete this lab if you did not successfully complete **Lab 1-1**.

Getting Started

In this exercise, you will start the VM provisioned in **Lab 1-1**. You will then connect to the VM to complete the exercises in this lab.

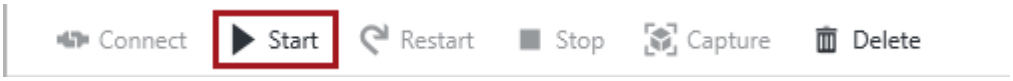
1. Sign in to the **Azure Portal** by using your subscription.

2. In the left pane, select **Virtual Machines**—do not select **Virtual Machines (Classic)**.



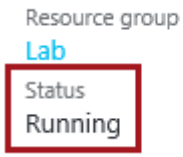
3. In the **Virtual Machines** blade, select the VM you provisioned in **Lab 1-1**.

4. In the VM blade, click **Start**.

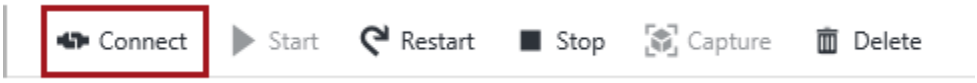


5. Wait for the VM status to update to **Running**.

   It usually takes 1-2 minutes for the VM to start.



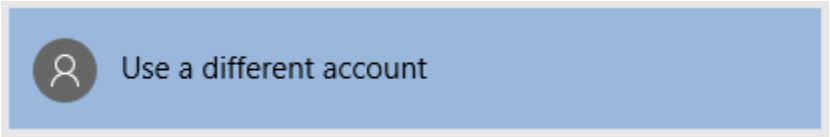
6. To connect to the VM, click **Connect**.



7. When prompted to open the Remote Desktop File, click **Open**.

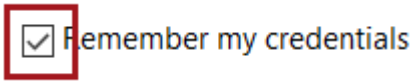
8. If prompted to connect to the unknown publisher, click **Connect**.

9. If prompted, in the **Windows Security** dialog window, click **Use a Different Account**.



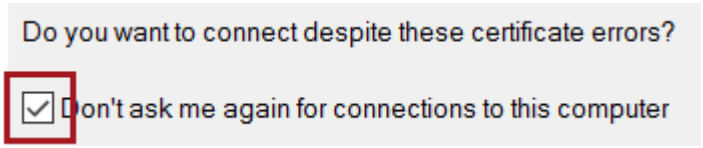
10. Enter the credentials you created for your VM.

11. Check the **Remember My Credentials** checkbox.



12. Click **OK**.

13. In the **Remote Desktop Connection** dialog window, check the **Don't Ask Me Again for Connections to This Computer** checkbox.



14. Click **Yes**.

Exercise 1: Creating a Model

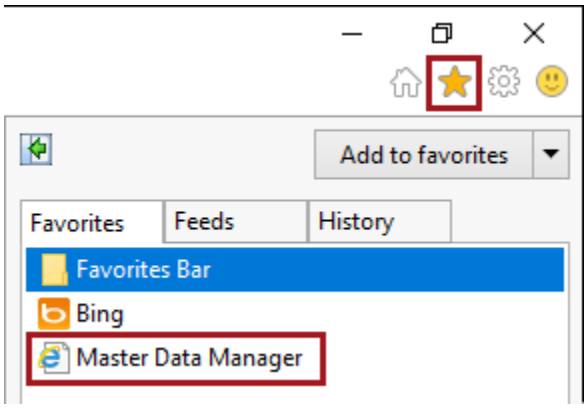
In this exercise, you will use Master Data Manager to create the **AdventureWorksBI** model.

Creating a Model

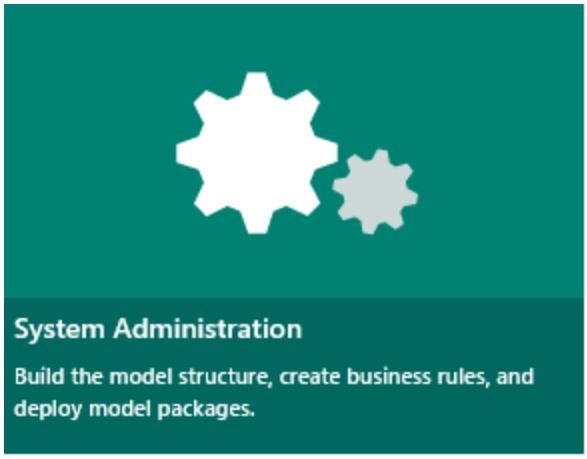
In this task, you will use Master Data Manager to create the **AdventureWorksBI** model.

1. Open Internet Explorer.

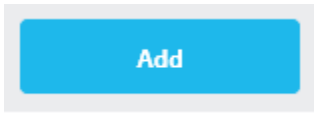
2. In Internet Explorer, open the **Master Data Manager** favorite.



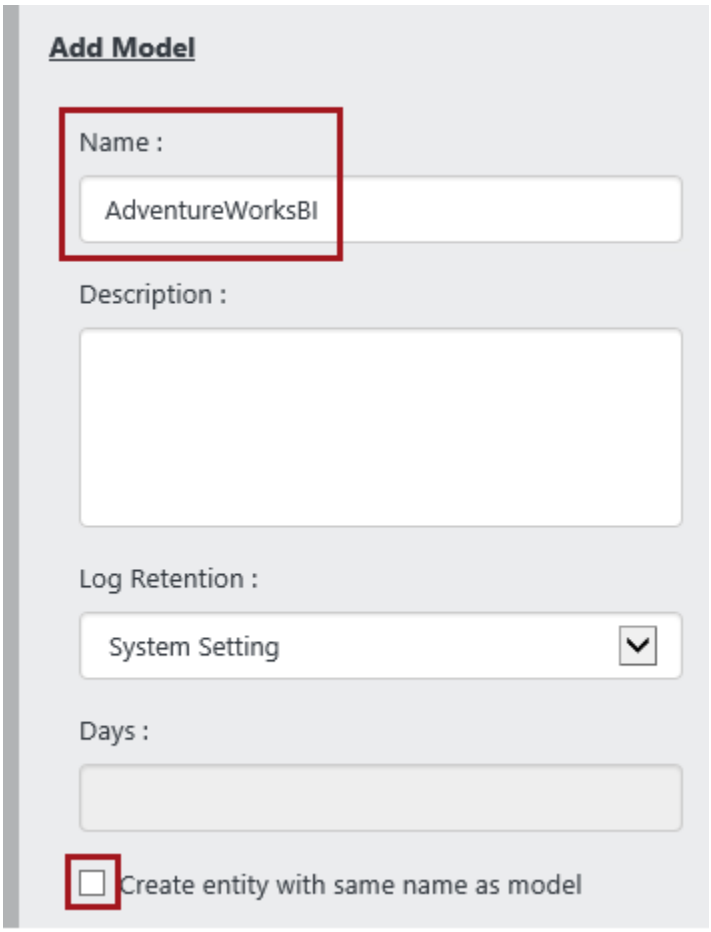
3. On the web application home page, click the **System Administration** tile.



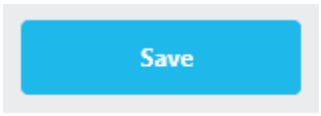
4. To create a model, click **Add**.



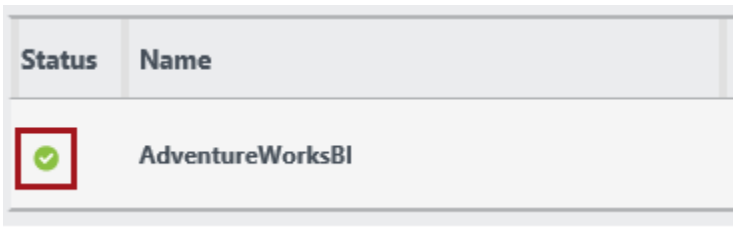
5. In the **Add Model** panel (located at the right), in the **Name** box, enter **AdventureWorksBI**, and then uncheck the **Create Entity with Same Name as Model** checkbox.



6. Click **Save**.



7. In the model list, verify that the model has been successfully created.



8. Leave the Internet Explorer window open.

Exercise 2: Creating and Managing Entities

In this exercise, you will create and manage four master data entities by using the Master Data Services Add-in for Excel. You will also add a new member to two of the entities.

When creating the entities in this exercise it is very important that you name them as instructed. The final exercise in this lab includes a pre-built solution that references the entities by name.

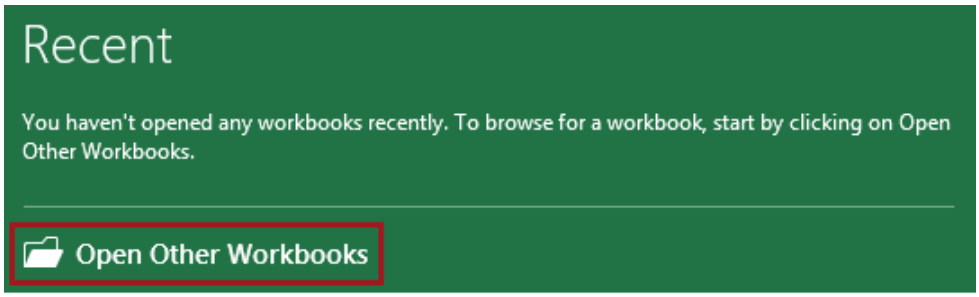
Creating the CountryRegion Entity

In this task, you will create the **CountryRegion** entity.

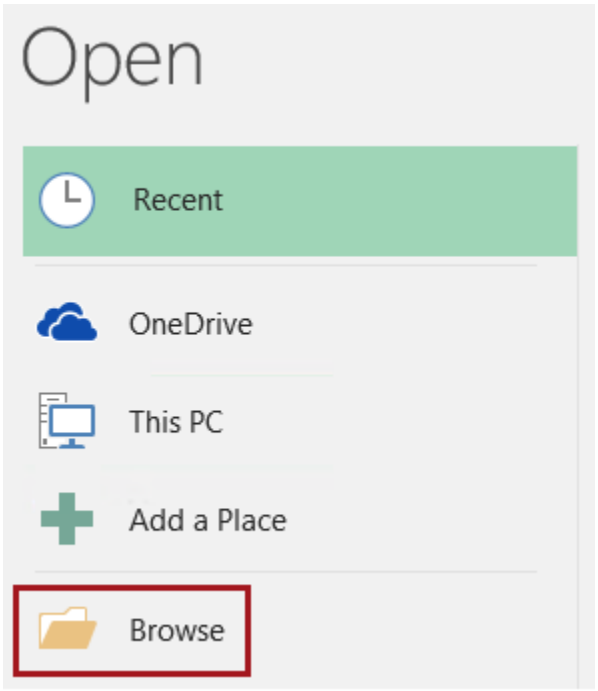
1. Open Excel.

2. If prompted to activate Office, click **Cancel**.

3. To open an existing workbook, in the **Recent** pane (located at the left), click **Open Other Workbooks**.

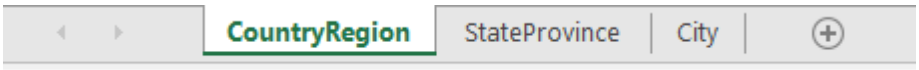


4. Click **Browse**.



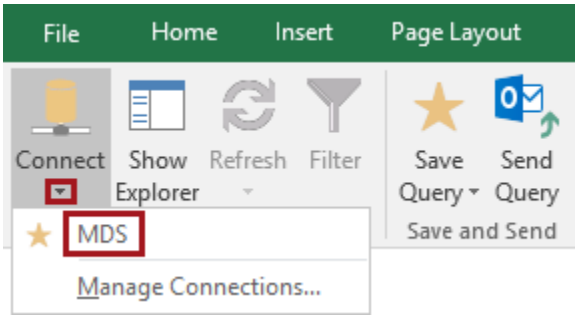
5. In the **Open** window, navigate to the **F:\Labs\Lab2-1\Assets** folder, select the **Geography.xlsx** file, and then click **Open**.

6. In the workbook, notice the three worksheets, each representing a different geographic entity.

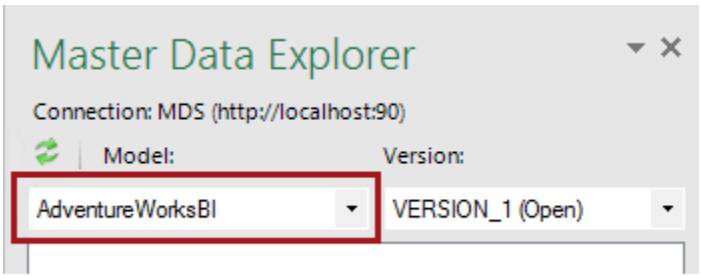


7. On the **Master Data** ribbon, from inside the **Connect and Load** group, click the down-arrow below the **Connect** button, and then select **MDS**.

   *This is the connection you created in **Lab 1-1**. If the **MDS** connection is not available, refer the instruction in the previous lab.*

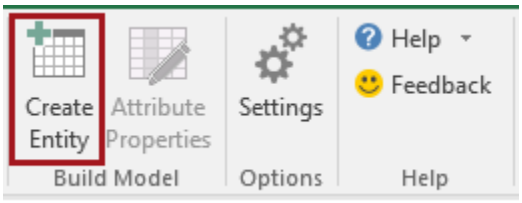


8. In the **Master Data Explorer** pane (located at the right), in the **Model** dropdown list, select **AdventureWorksBI**.



9. To create a new entity, first ensure the **CountryRegion** worksheet is in focus, and that the entire table (range **A1:D7**) is selected.

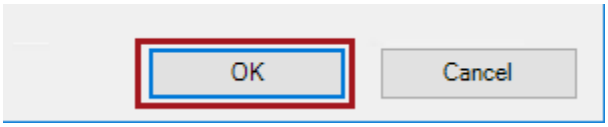
10. On the **Master Data** ribbon, from inside the **Build Model** group, select **Create Entity**.



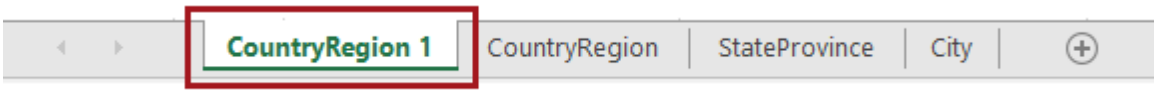
11. In the **Create Entity** window, configure the following properties.

Property	Value
Range	$A$1:$D$7 (set by default)
Model	AdventureWorksBI
New Entity Name	CountryRegion
Code	CountryRegionCode
Name	EnglishCountryRegionName

12. Click **OK**.

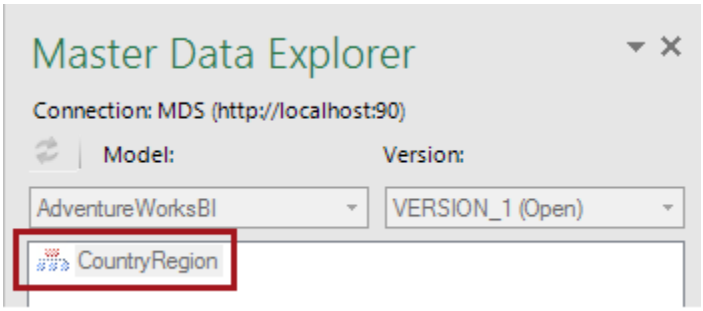


13. Notice the addition of the **CountryRegion 1** worksheet.



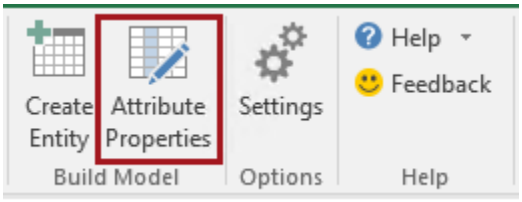
This worksheet includes an Excel table that is the query result of the newly created entity. The table can be filtered, sorted and the master list values modified. Modified data can be published back to the server. You will work with this functionality later in this exercise.

14. In the **Master Data Explorer** pane, notice also the addition of the **CountryRegion** entity.

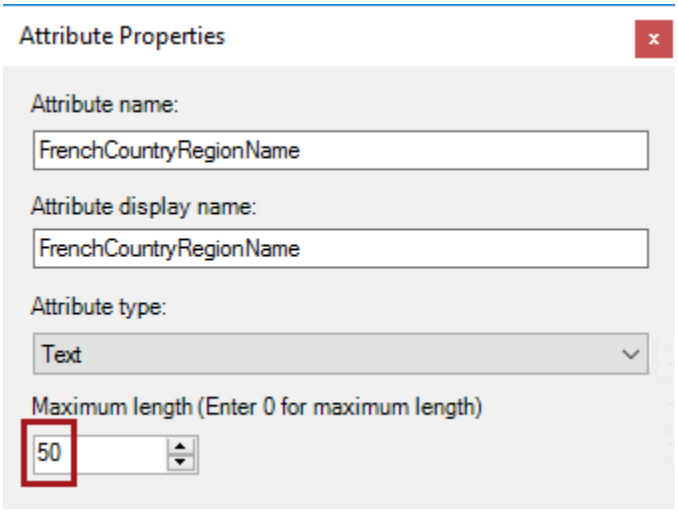


15. Select the **FrenchCountryRegionName** table header (cell **P2**).

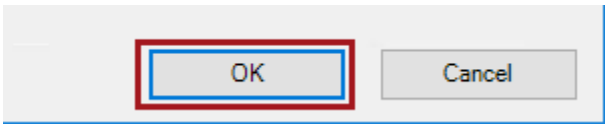
16. On the **Master Data** ribbon, from inside the **Build Model** group, select **Attribute Properties**.



17. In the **Attribute Properties** window, modify the **Maximum Length** property to **50**.



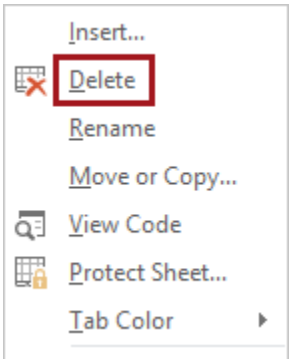
18. Click **OK**.



19. Modify also the **SpanishCountryRegionName** attribute to a maximum length of **50**.

20. To delete the **CountryRegion 1** worksheet, right-click the **CountryRegion 1** worksheet, and then select **Delete**.

21. When prompted to confirm the deletion, click **Delete**.



This action does not delete the published entity or its members.

Creating the StateProvince Entity

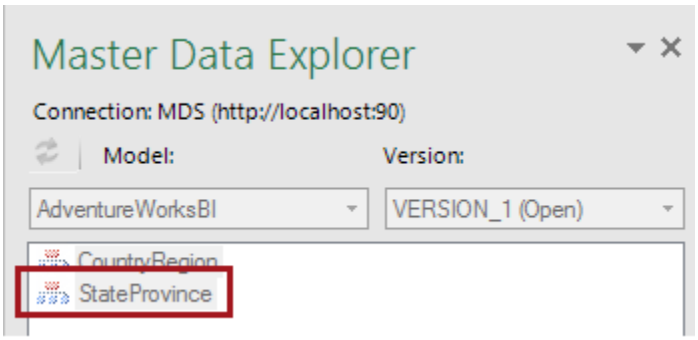
In this task, you will create the **StateProvince** entity. You will also create the **SalesTerritoryRegion** entity based on the existing values in the **StateProvince** entity's **SalesTerritoryRegion** attribute.

1. Select the **StateProvince** worksheet.

2. Create a new entity based on the following properties.

Property	Value
Range	$A$1:$E$72 (set by default)
Model	AdventureWorksBI
New Entity Name	StateProvince
Code	StateProvinceKey
Name	StateProvinceName

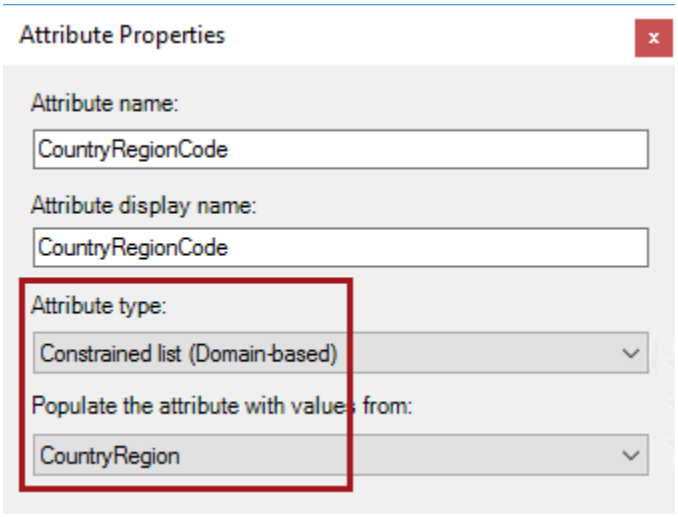
3. In the **Master Data Explorer** pane, verify the addition of the **StateProvince** entity.



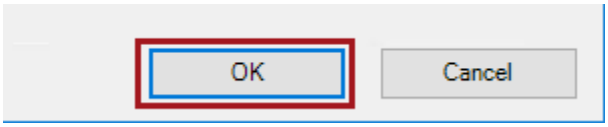
4. Open the attribute properties for the **CountryRegionCode** attribute (column **P**).

5. To create a domain lookup, in the **Attribute Type** dropdown list, select **Constrained List (Domain-Based)**.

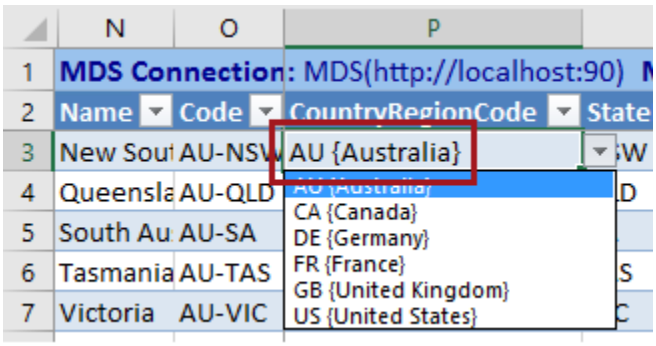
6. In the **Populate the Attribute with Values From** dropdown list, select **CountryRegion**.



7. Click **OK**.

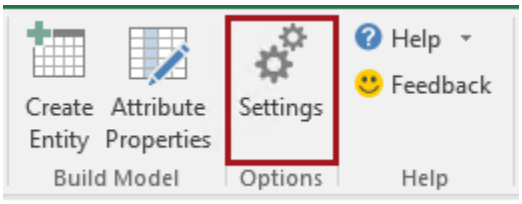


8. Select cell **P3**, and then notice that the **CountryRegionCode** attribute values are now available for selection in a dropdown list.

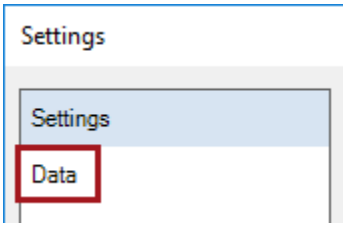


*The available values in the dropdown list are sourced from the **CountryRegion** entity created in the previous task. The list presents the member code followed by the member name presented in braces ({}), and are sorted by the member name.*

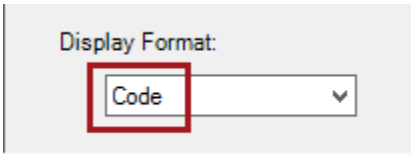
9. To view only the code value in the list, on the **Master Data** ribbon, from inside the **Options** group, select **Settings**.



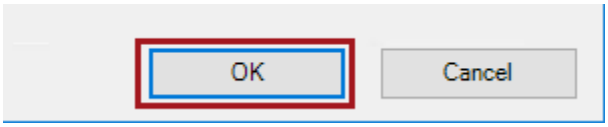
10. In the **Settings** window, select the **Data** page.



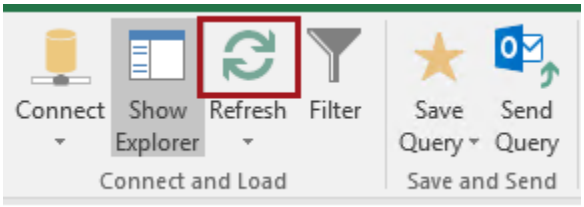
11. In the **Display Format** dropdown list, select **Code**.



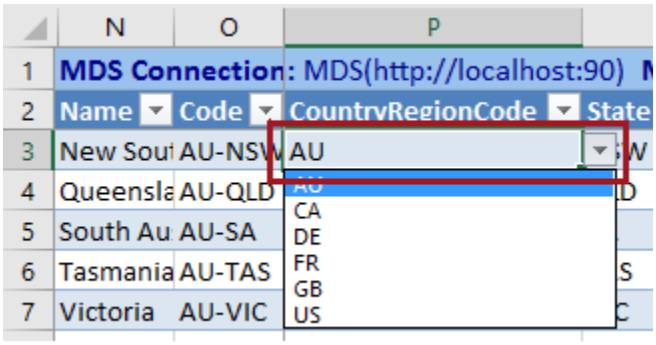
12. Click **OK**.



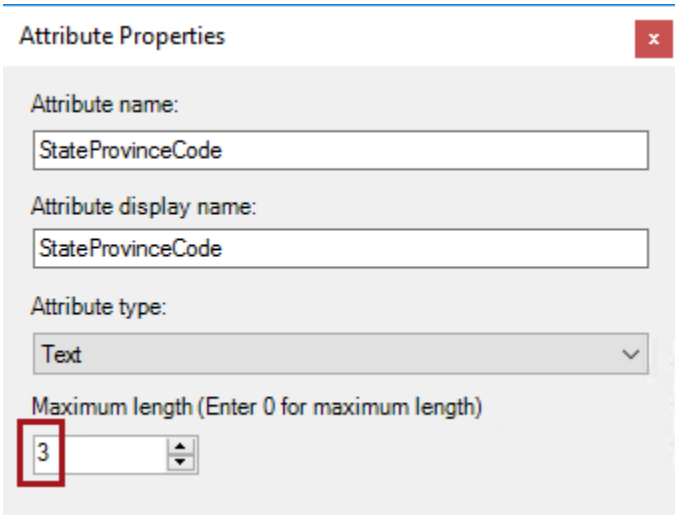
13. To reload the master list, on the **Master Data** ribbon, from inside the **Connect and Load** group, select **Refresh**.



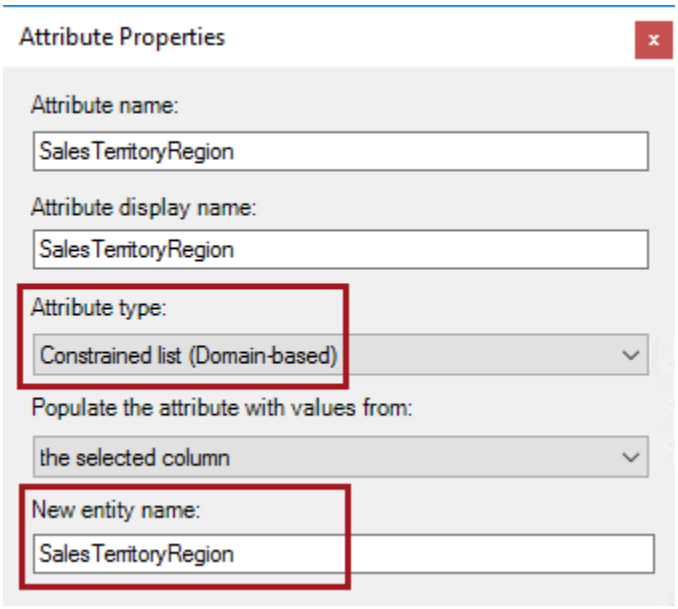
14. Notice that the **CountryRegionCode** available values are described only by the code.



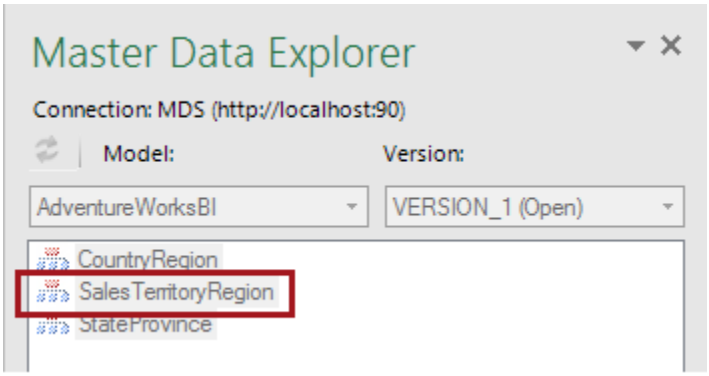
15. Modify the **StateProvinceCode** attribute to a maximum length of **3**.



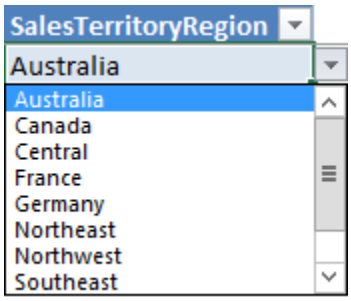
16. Configure the **SalesTerritoryRegion** attribute to create a domain lookup to a new entity based on the attribute values.



17. In the **Master Data Explorer** pane, verify the addition of the **SalesTerritoryRegion** entity.



18. Select cell **R3**, and then notice that the **SalesTerritoryRegion** attribute values are now available for selection in a dropdown list.



Lab-based Knowledge Check
Lab 2-1 ► Sales Territory Region Assignment

To which sales territory region is the US state of **Alabama** assigned?

You may need data from this step to answer a Lab-based Knowledge Check associated with this module.

*At this time, we recommend that you open the **Module 1** Lab-based Knowledge Check portion of the course in EdX to answer the questions as you complete this lab.*

Publishing a New StateProvince Member

In this task, you will publish a new **StateProvince** member.

1. Scroll to the bottom of the table, and then select cell **N74**.

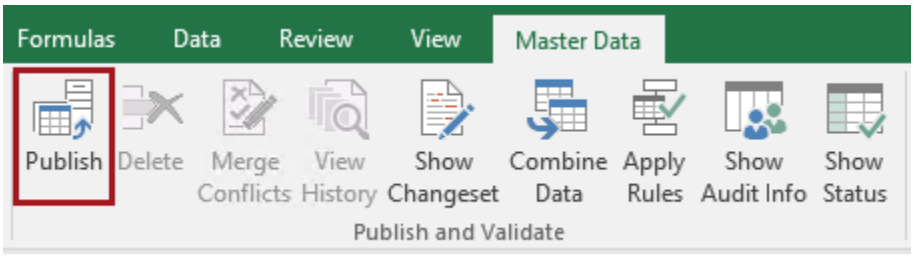
2. Enter the following values in row **74**.

   If necessary, you can widen the columns.

Attribute	Value
Name	Western Australia
Code	AU-WA
CountryRegionCode	AU (use the dropdown list)
StateProvinceCode	WA
SalesTerritoryRegion	Australia (use the dropdown list)

3. Ensure that you press **Enter** to register the data input.

4. To publish the new member, on the **Master Data** ribbon, from inside the **Publish and Validate** group, select **Publish**.



5. In the **Publish and Annotate** window, click **Publish**.

6. Notice that the master list refreshes.

7. In row **3**, notice the addition of the new member.

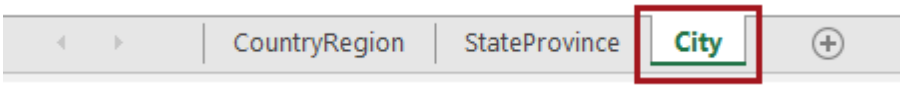
	N	O	P	Q	R
1	MDS Connection: MDS(http://localhost:90)Model: AdventureWorksBIVersion: VERSION_1Entity				
2	Name	Code	CountryRegionCode	StateProvinceCode	SalesTerritoryRegion
3	Western Australia	AU-WA	AU	WA	Australia
4	New South Wales	AU-NSW	AU	NSW	Australia
5	Queensland	AU-QLD	AU	QLD	Australia

8. Delete the **StateProvince 1** worksheet.

Creating the City Entity

In this task, you will create the **City** entity.

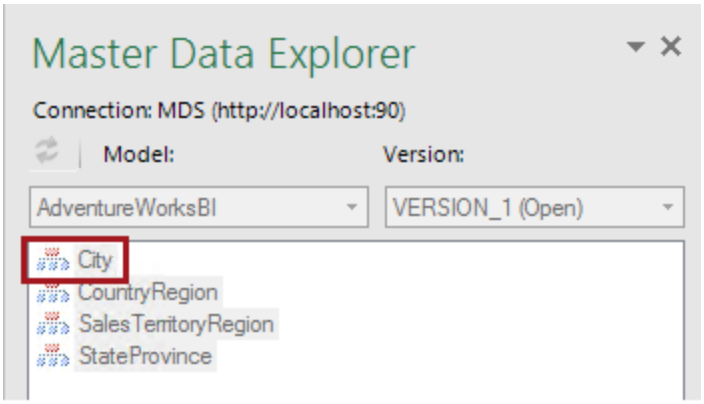
1. Select the **City** worksheet.



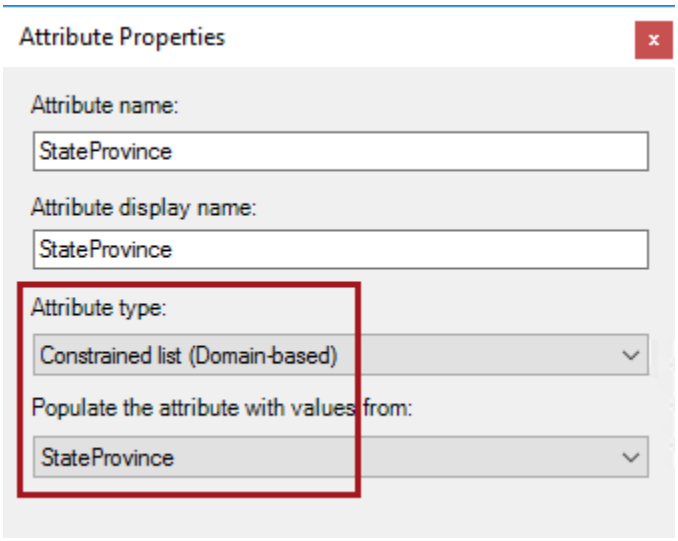
2. Create a new entity based on the following properties.

Property	Value
Range	$A$1:$D$656 (set by default)
Model	AdventureWorksBI
New Entity Name	City
Code	Generate code automatically
Name	City

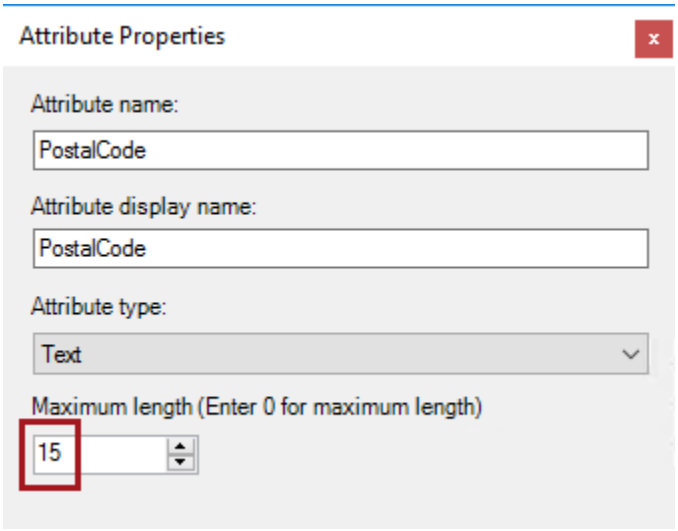
3. In the **Master Data Explorer** pane, verify the addition of the **City** entity.



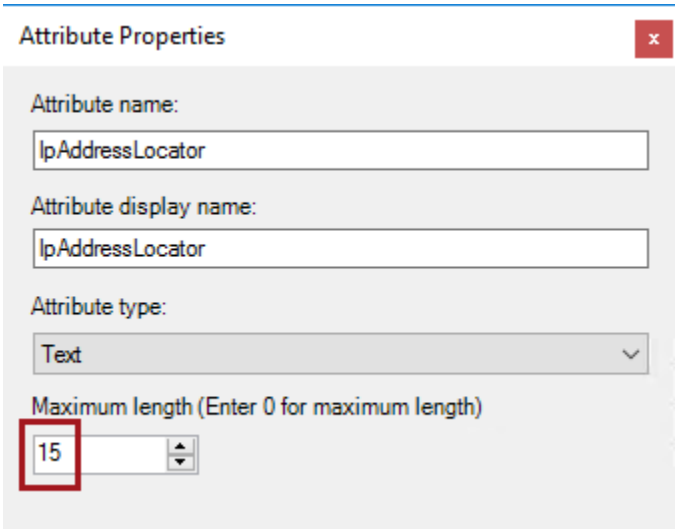
4. Configure the **StateProvince** attribute to create a domain lookup to the **StateProvince** entity.



5. Modify the **PostalCode** attribute to a maximum length of **15**.



6. Modify the **IpAddressLocator** attribute to a maximum length of **15**.



Publishing a New City Member

In this task, you will publish a new **City** member.

1. Scroll to the bottom of the table, and then select cell **N658**.

2. Enter the following values in row **658**.

Attribute	Value
Name	Perth
Code	(Do not enter a value—a unique code will be automatically generated)
StateProvince	AU-WA (use the dropdown list, with the item located close to the end)
PostalCode	6000
IpAddressLocator	203.0.113.149

3. Ensure that you press **Enter** to register the data input.

4. Publish the new member.

5. In row **3**, notice the addition of the new member, together with its automatically generated code value.

	N	O	P	Q	R
1	**MDS Connection:** MDS(http://localhost:90)		**Model:** AdventureWorksBI		**Versi**
2	Name	Code	StateProvince	PostalCode	IpAddressLocator
3	Perth	656	AU-WA	6000	203.0.113.149
4	Alexandria	1	AU-NSW	2015	198.51.100.2
5	Newcastle	10	AU-NSW	2300	198.51.100.11

Finishing Up

In this task, you will close Excel.

1. Close Excel.

2. When prompted to save changes, click **Don't Save**.

   The remaining exercises for this lab will manage and explore the model by using the Master Data Manager Web application.

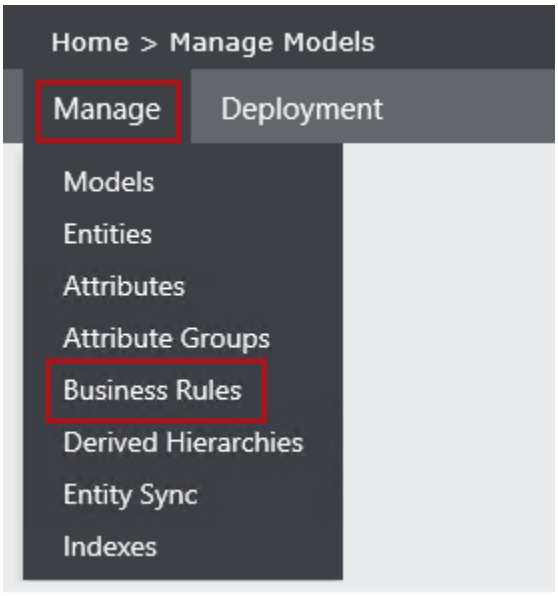
Creating a Business Rule

In this exercise, you will create a business rule for the **City** entity.

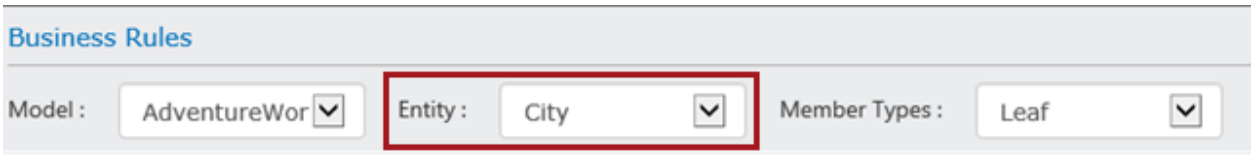
Creating a Business Rule

In this task, you will create a business rule for the **City** entity to ensure that valid IP addresses are stored.

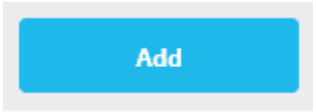
1. In Master Data Manager, click the **Manage** menu, and then select **Business Rules**.



2. Ensure that the **City** entity is selected.



3. To create a business rule, click **Add**.



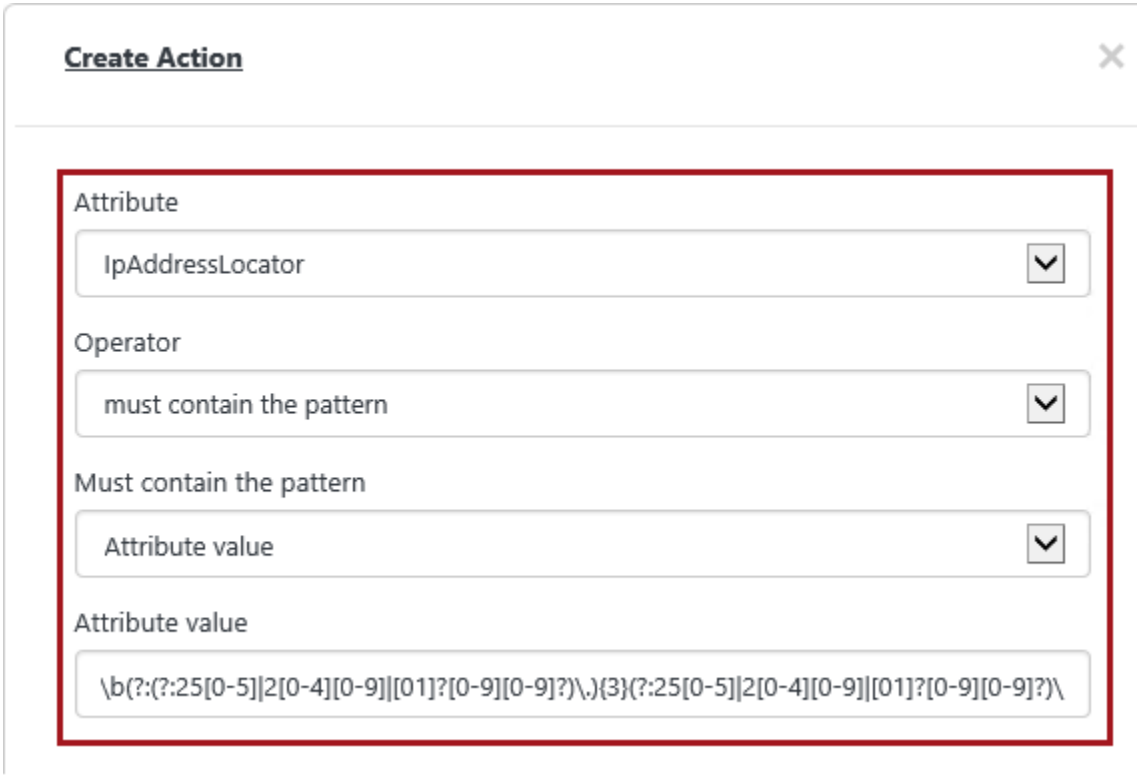
4. In the **Add Business Rule** window, in the **Name** box, enter **Valid IP Address**.

5. To add an action, inside the **Then** group, click the **Add** link.

6. In the **Create Action** window, configure the following properties.

*For convenience, the attribute value (regular expression) can be copied from the **F:\Labs\Lab2-1\Assets\Snippets.txt** file.*

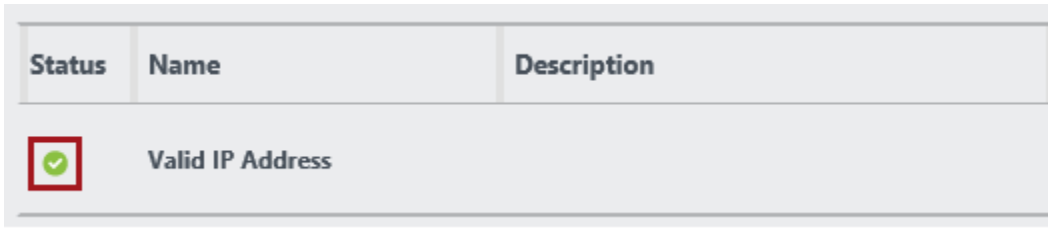
Property	Value
Attribute	IpAddressLocator
Operator	Must contain the pattern
Must contain the pattern	Attribute value
Attribute value	\b(?:(?:25[0-5]|2[0-4][0-9]|[01]?[0-9][0-9]?)\.){3}(?:25[0-5]|2[0-4][0-9]|[01]?[0-9][0-9]?)\b



7. Click **Save**.

8. In the **Add Business Rule** window, click **Save**.

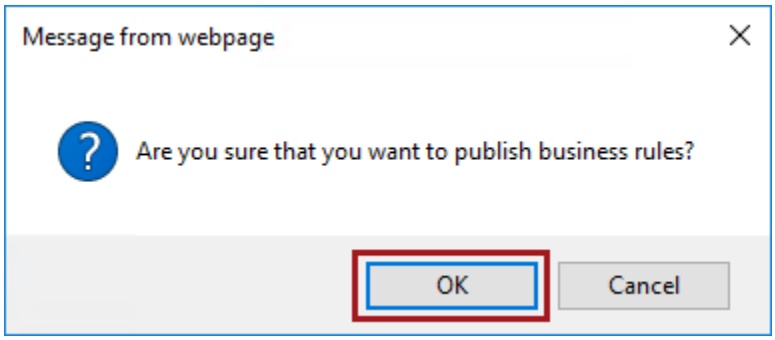
9. In the business rules list, verify that the business rule has been successfully created.



10. To review the business rule definition, in the list, select the **Valid IP Address** business rule.

11. To publish the business rule, click **Publish All**.

12. When prompted to confirm publishing the business rule, click **OK**.



You will validate the city members in the last exercise of this lab.

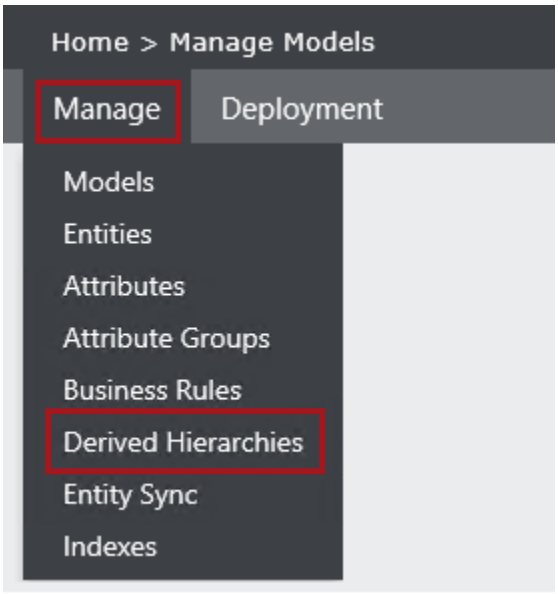
Creating a Derived Hierarchy

In this exercise, you will create a derived hierarchy to enable navigation between the different geographic entities.

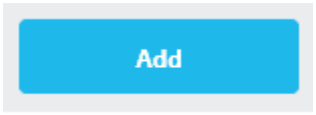
Creating a Derived Hierarchy

In this task, you will create a derived hierarchy to enable navigation between the different geographic entities.

1. Click the **Manage** menu, and then select **Derived Hierarchies**.

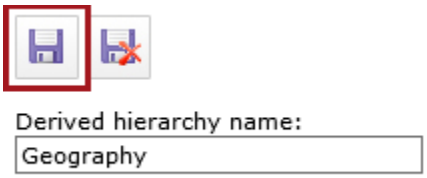


2. To create a derived hierarchy, click **Add**.

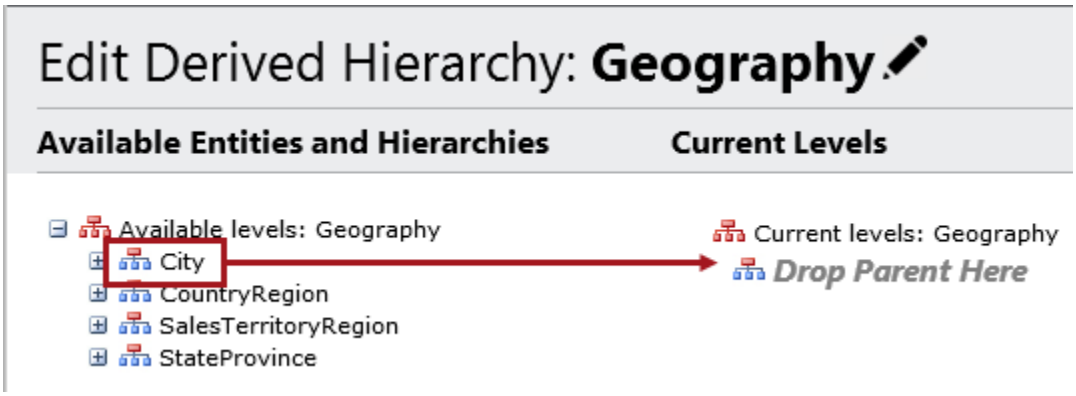


3. In the **Derived Hierarchy Name** box, enter **Geography**.

4. Click the **Save Derived Hierarchy** button.



5. To assemble the hierarchy, in the **Available Entities and Hierarchies** section, select and then drag **City** on top of the **Drop Parent Here** node.



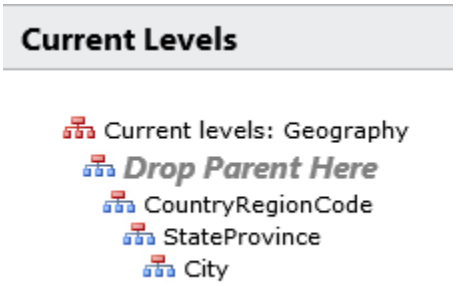
Hierarchies are assembled from the lowest to highest levels.

6. To add the next level to the hierarchy, drag **StateProvince** on top of the **Drop Parent Here** node.

7. Add the **CountryRegionCode** as the third level.

8. Verify that the hierarchy consist of the following three levels:

   - CountryRegionCode
   - StateProvince
   - City



9. To rename the first level, select the **CountryRegionCode** level.

10. In the **Display Name** box, replace the text with **Country**.

11. Click the **Save Selected Hierarchy** Item button.

12. In the **Preview** section, review the hierarchy.

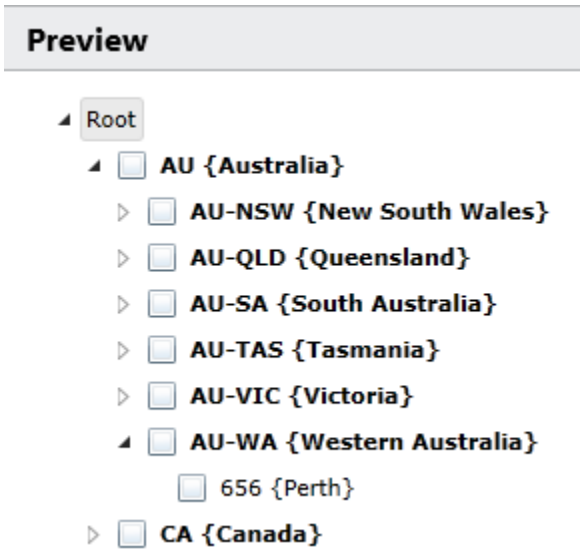
Lab-based Knowledge Check

Lab 2-1 ► Number of Distinct Countries Listed

How many distinct countries are listed in the **Geography** hierarchy?

You may need data from this step to answer a Lab-based Knowledge Check associated with this module.

13. In the preview, expand **AU {Australia}**, and then expand **AU-WA {Western Australia}**.



Managing Master Data

In this exercise, you will use the Master Data Manager Web application to explore the members from the **StateProvince** entity, and then apply a data correction to one member.

You will then explore the members of the **City** entity, apply business rules, and then review and correct invalid members.

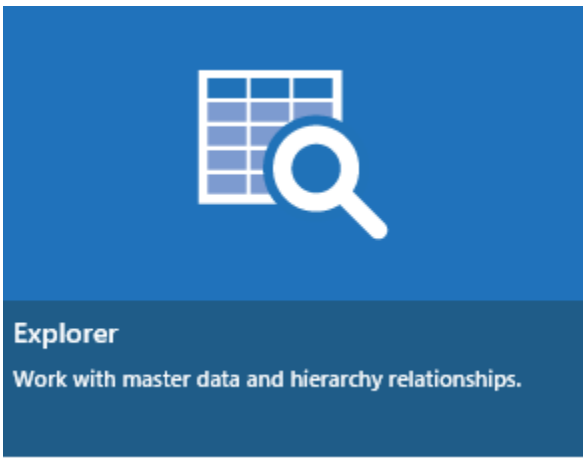
Note that all tasks in this exercise could also be completed by using the Master Data Services Add-in for Excel.

Exploring the StateProvince Entity

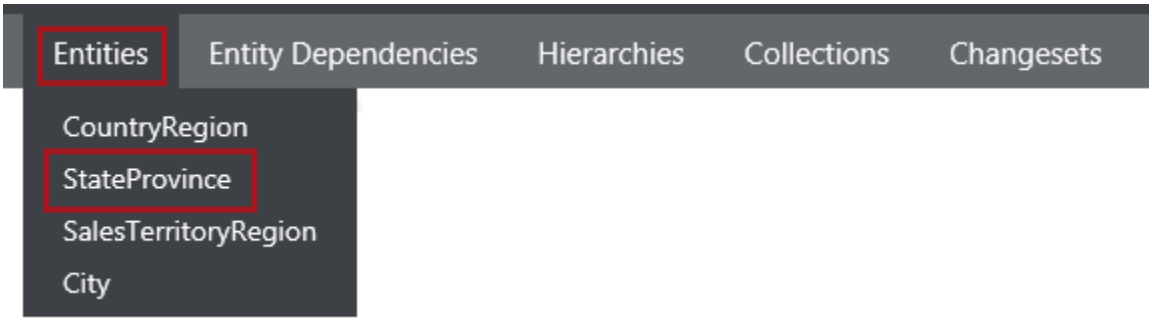
In this task, you will explore the **StateProvince** members, and then apply a data correction to one of the members.

1. Return to the Master Data Manager home page.

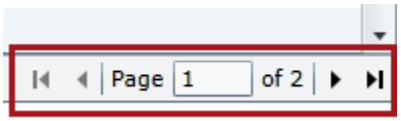
2. On the Master Data Manager home page, click the **Explorer** tile.



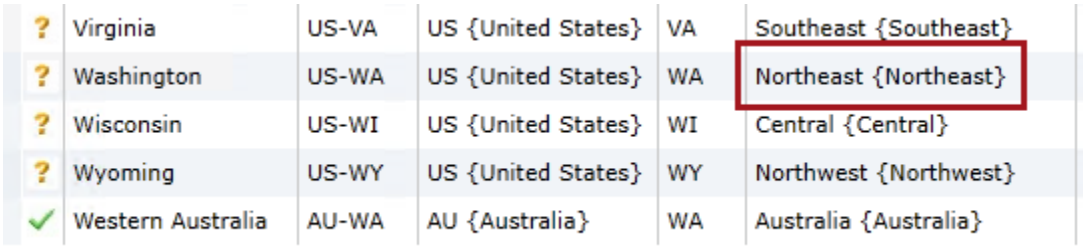
3. Click the **Entities** menu, and then select **StateProvince**.



4. Use the page navigation controls (located at the bottom-right corner of the data grid) to locate the **Washington** member.



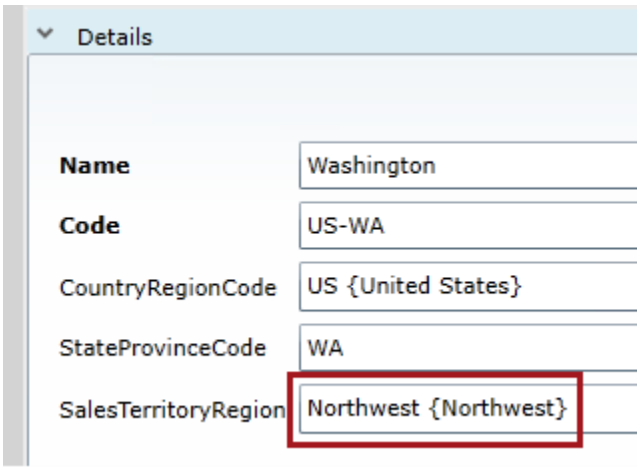
5. Notice that the state of **Washington** has been incorrectly assigned to the **Northeast** region (it should be **Northwest**).



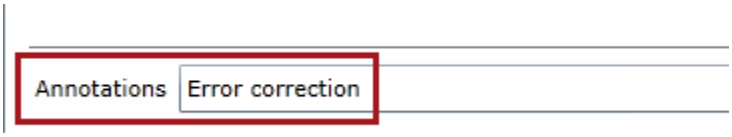
?	Virginia	US-VA	US {United States}	VA	Southeast {Southeast}
?	Washington	US-WA	US {United States}	WA	Northeast {Northeast}
?	Wisconsin	US-WI	US {United States}	WI	Central {Central}
?	Wyoming	US-WY	US {United States}	WY	Northwest {Northwest}
✓	Western Australia	AU-WA	AU {Australia}	WA	Australia {Australia}

6. Select the **Washington** member (row).

7. In the details pane (located at the right), in the **SalesTerritoryRegion** dropdown list, select **Northwest {Northwest}**.

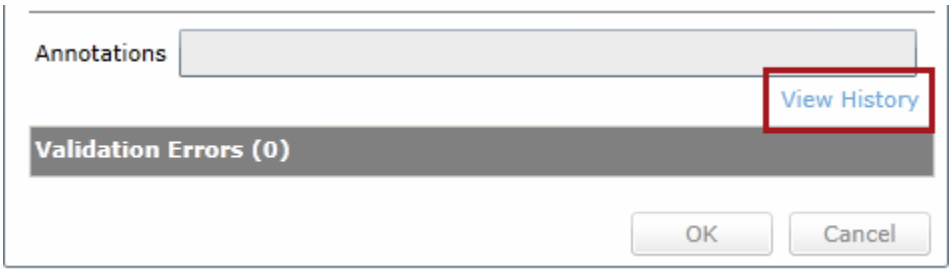


8. In the **Annotations** box, enter **Error correction**.



9. Click **OK**.

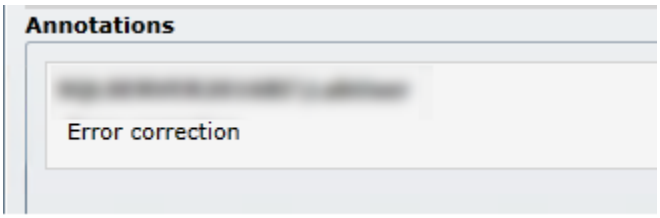
10. To review the changes made to the member, click the **View History** link.



11. Review the history available for the **Washington** member in the grid.

    *Each of the revisions represents a change made to the **Washington** member. The first revision was when the member was added, with each of the following three revisions representing the addition of the attribute values (**CountryRegionCode**, **StateProvinceCode** and **SalesTerritoryRegion**). The last revision was for the **SalesTerritoryRegion** update that you just made.*

12. Review also the annotation, and notice that it is recorded together with the user account and time stamp.



13. Click **Close**.

Lab-based Knowledge Check

Lab 2-1 ► Count of States Starting with the Letter P

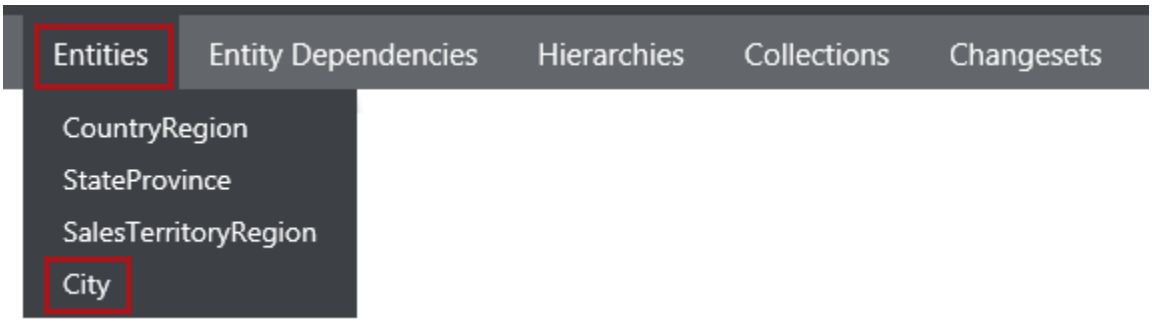
How many state names in the United States start with the letter **P**?

You may need data from this step to answer a Lab-based Knowledge Check associated with this module.

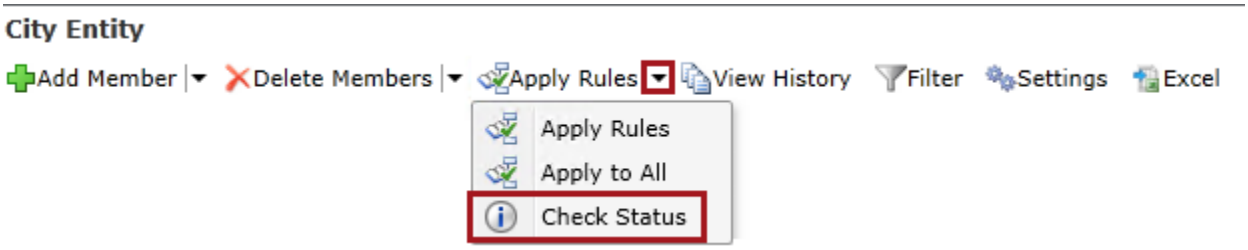
Applying Business Rules

In this task, you will apply business rules to the **City** entity.

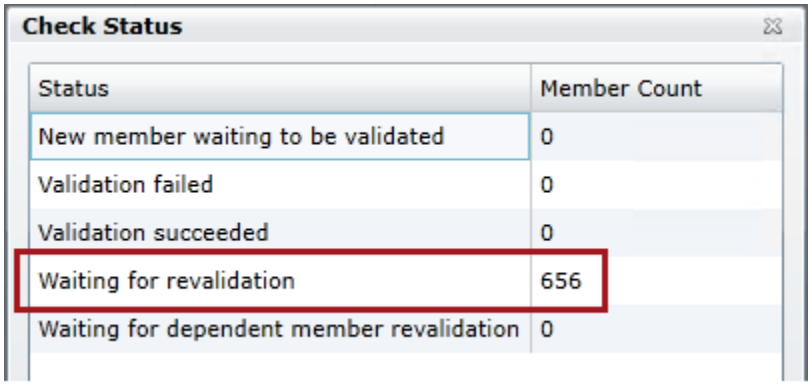
1. Click the **Entities** menu, and then select **City**.



2. To check the entity validation status, to the right of **Apply Rules**, click the down-arrow, and then select **Check Status**.

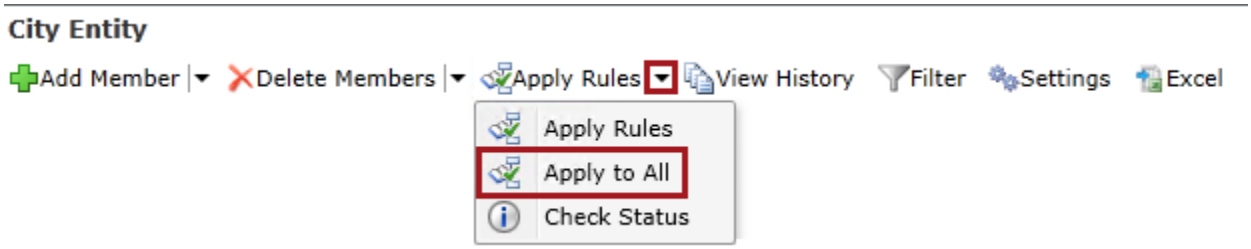


3. In the window, notice that all members are not yet validated.



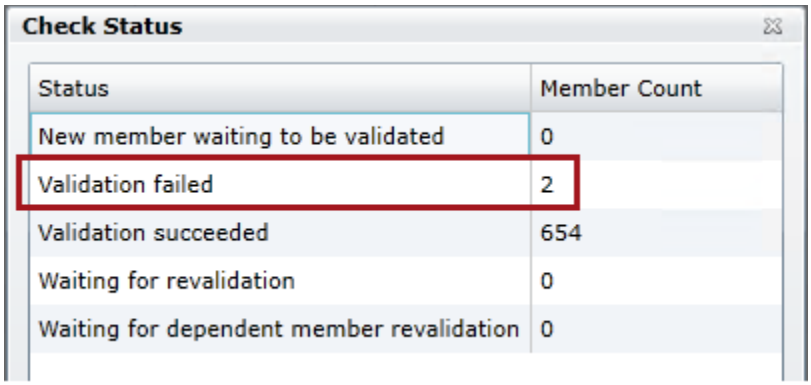
4. Click **Close**.

5. To apply business rules to all members, to the right of **Apply Rules**, click the down-arrow, and then select **Apply to All**.



6. When prompted to confirm, click **OK**.

7. Check the entity validation status again, and notice that two members failed validation.

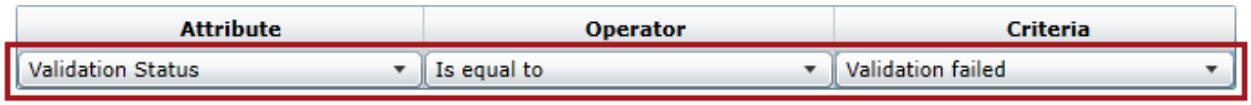


8. Click **Close**.

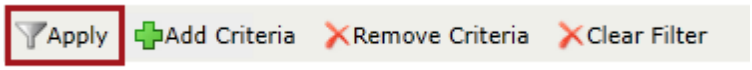
9. To review the two members with invalid IP addresses, click **Filter**.

10. In the filter pane, configure the following properties.

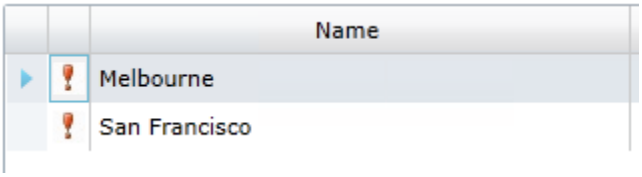
Property	Value
Attribute	Validation Status
Operator	Is equal to
Criteria	Validation failed



11. Click **Apply**.



12. Notice the two cities with invalid IP addresses.



Lab-based Knowledge Check
Lab 2-1 ► Count of Cities in Alberta

When applying a filter to the **City** entity, how many cities are listed for the Canadian province of **Alberta**?

You may need data from this step to answer a Lab-based Knowledge Check associated with this module.

Applying Data Corrections

In this task, you will apply data corrections to the invalid **City** members.

1. Select the **Melbourne** member.

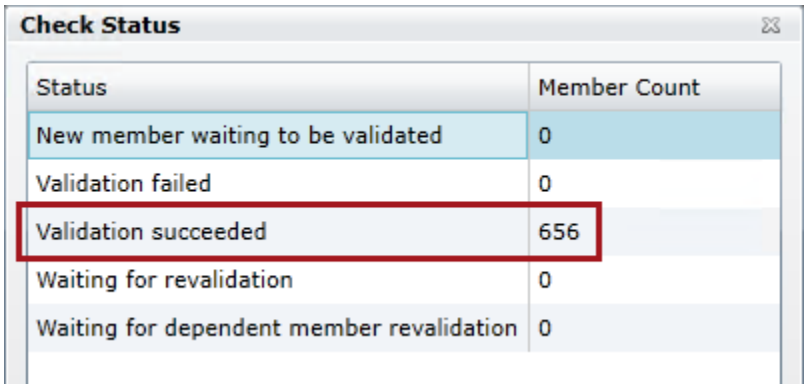
Lab Check
Lab 2-1 ► Invalid IPAddressLocator Value

What is the invalid **IPAddressLocator** value for the city of **Melbourne**?

You may need data from this step to answer a Lab-based Knowledge Check associated with this module.

2. In the details pane, in the **IpAddressLocator** box, modify the value to **198.51.100.36**.
3. In the **Annotations** box, enter **Error correction**.
4. Click **OK**.
5. Review the member history.
6. Modify also the IP address for **San Francisco** to **192.0.2.107**.

7. Check the status of all members, and verify that all members have successfully been validated.



8. Click **Close**.

Finishing Up

In this task, you will close any open applications.

1. Close the Internet Explorer window.

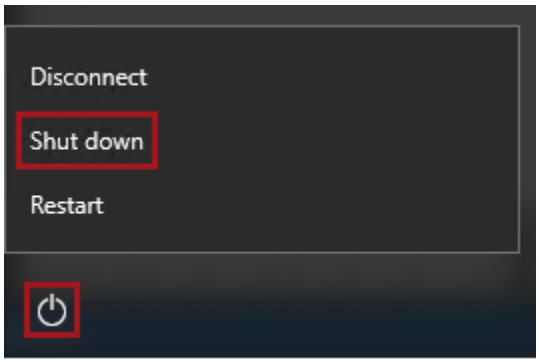
   You have now completed the lab. In the next lab, you will manage the Master Data Services solution.

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

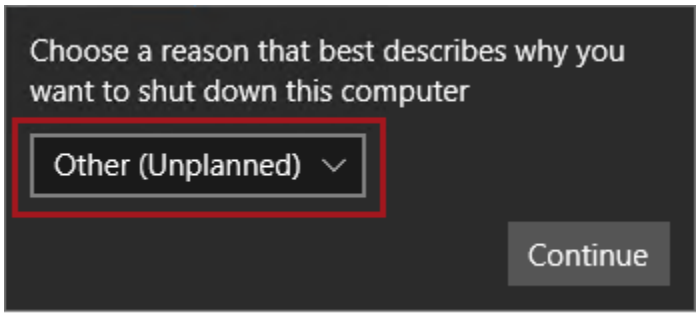
Finishing Up

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

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

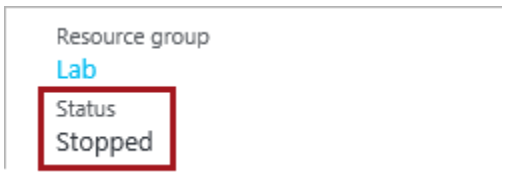


2. When prompted to choose a reason, to accept the default.



3. Click **Continue**.

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

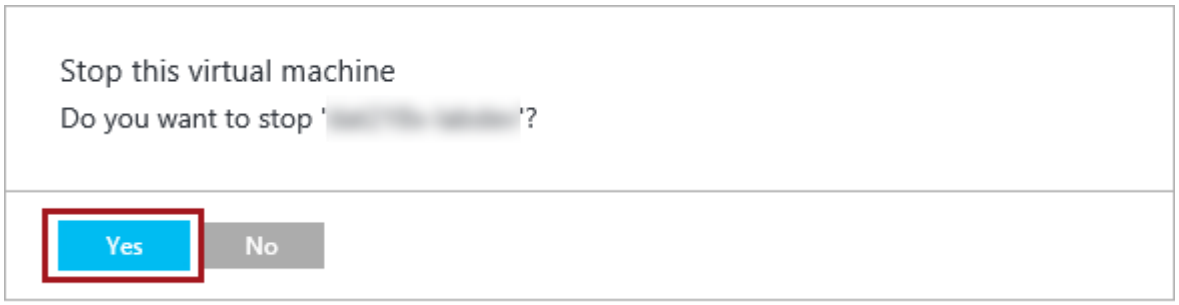


In this state, however, the VM is still billable.

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

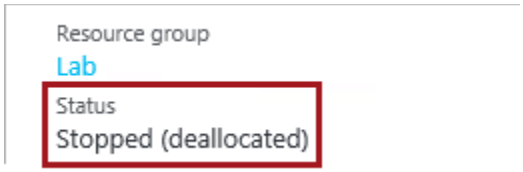
   Deallocation will take some minutes to complete, and also extends the time required to restart the VM. Consider deallocating the VM if you want to reduce costs, or if you choose to complete the next lab after an extended period.

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



   The deallocation can take several minutes to complete.

7. 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.

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