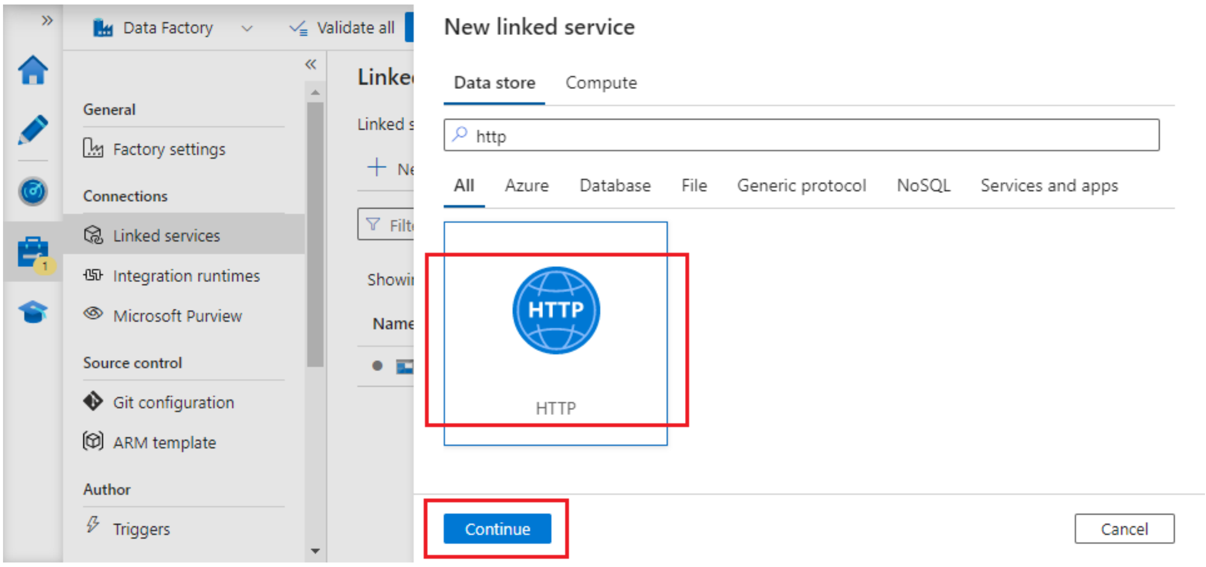
Lab 2 – Build a copy pipeline

In this lab you will create a pipeline to ingest data from a website and into your data lake. You'll be copying data from the "AdventureWorks" sample OLTP database, which is available from Microsoft's "sql-server-samples" repository on GitHub. The pipeline you build will copy a file directly from the GitHub website and into your data lake.

Lab 2.1 – Create source linked service

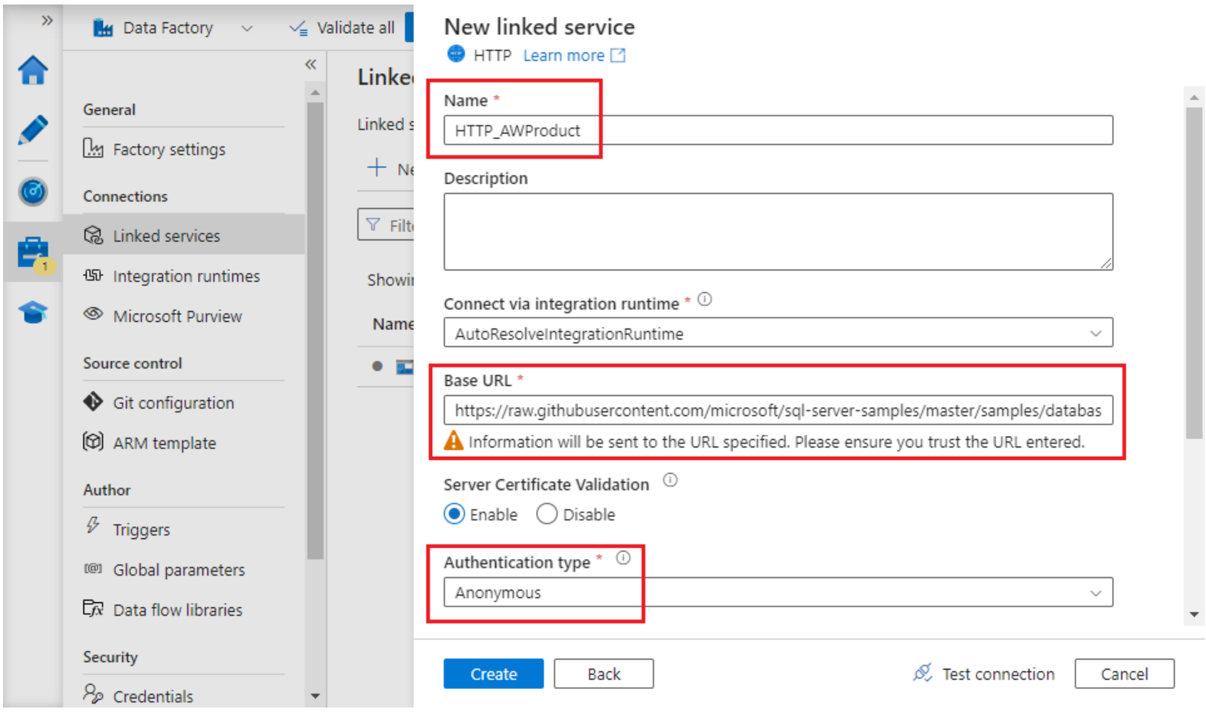
The linked service you created in Lab 1 defines a connection to your data lake. To copy data from an external web resource, a similar connection is required – in this section you'll create an HTTP linked service that enables access to a file on GitHub.

1. As in Lab 1.4, navigate to the Management hub in ADF Studio, open the "Linked services" page and click "+ New". This time, choose a linked service of type "HTTP" and click "Continue".



2. Configure the linked service like this:

- Give it a **Name**.
- Set its **Base URL** to "https://raw.githubusercontent.com/microsoft/sql-server-samples/master/samples/databases/adventure-works/oltp-install-script/Product.csv". This is the URL of a raw text file containing Adventure Works product data.
- Set **Authentication type** to "Anonymous".



New linked service

HTTP Learn more

Name *

HTTP_AWProduct

Description

Connect via integration runtime *

AutoResolveIntegrationRuntime

Base URL *

https://raw.githubusercontent.com/microsoft/sql-server-samples/master/samples/databas

Information will be sent to the URL specified. Please ensure you trust the URL entered.

Server Certificate Validation

● Enable ○ Disable

Authentication type *

Anonymous

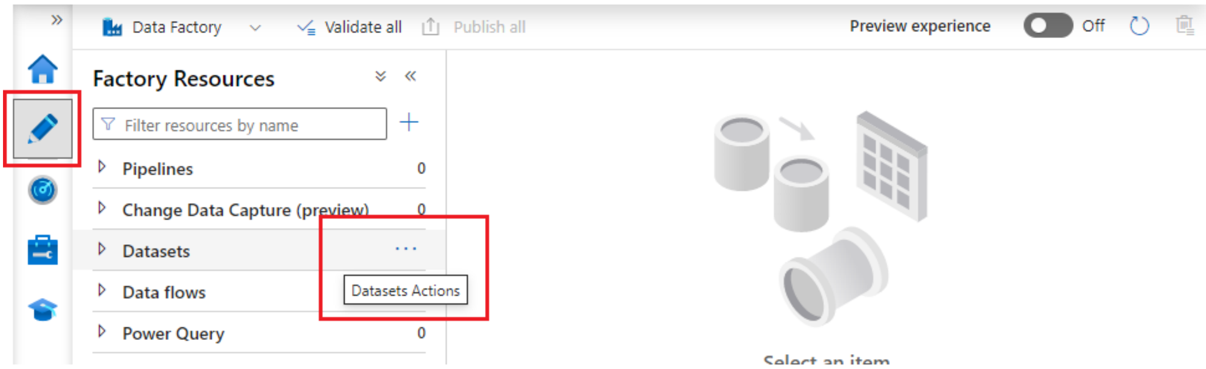
3. Click “Create”, then publish your changes.

Lab 2.2 – Create datasets

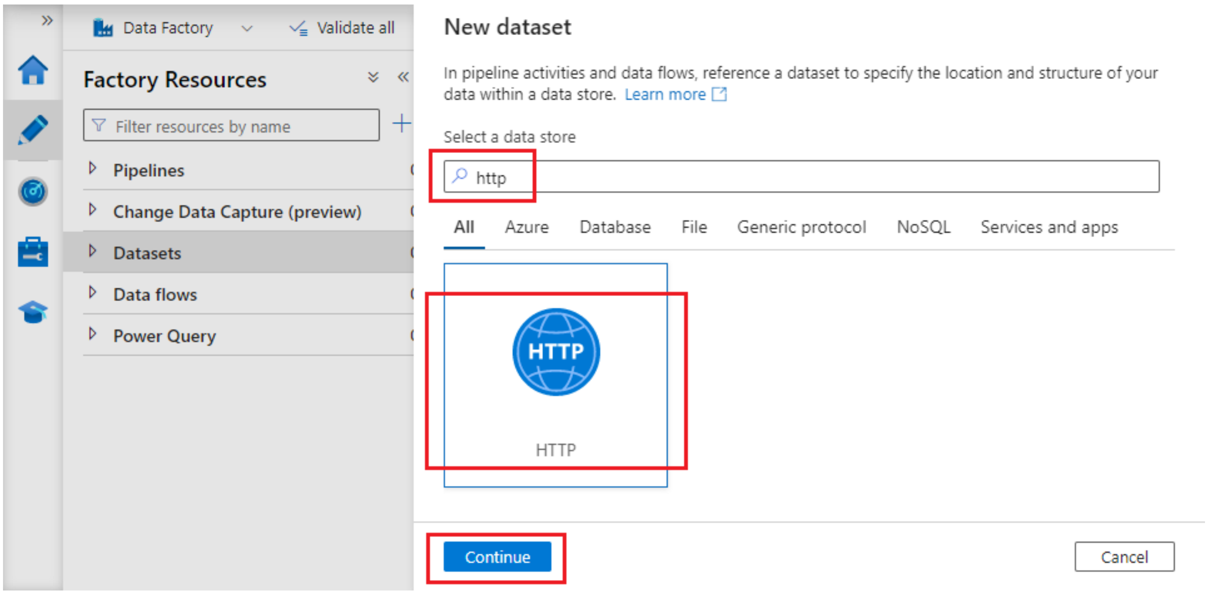
ADF linked services – such as those you created in Lab 1.4 and Lab 2.1 – represent connections to external systems, but not to the data objects inside those systems. Data stored by those systems must be represented using ADF **datasets**.

In this section you will create a dataset representing the source (GitHub) and sink (data lake) files. Your pipeline will copy data from the source dataset and into the sink dataset.

1. Navigate to the Authoring experience, using the “Author” button (pencil icon) in the ADF Studio sidebar. Hover over the number to the right of “Datasets” in the “Factory Resources” menu to reveal an ellipsis button. Click the button to expand the “Dataset Actions” menu.



2. From the “Dataset Actions” menu, choose “New dataset”, then search for and select the “HTTP” data store in the “New dataset” flyout. Click “Continue”.



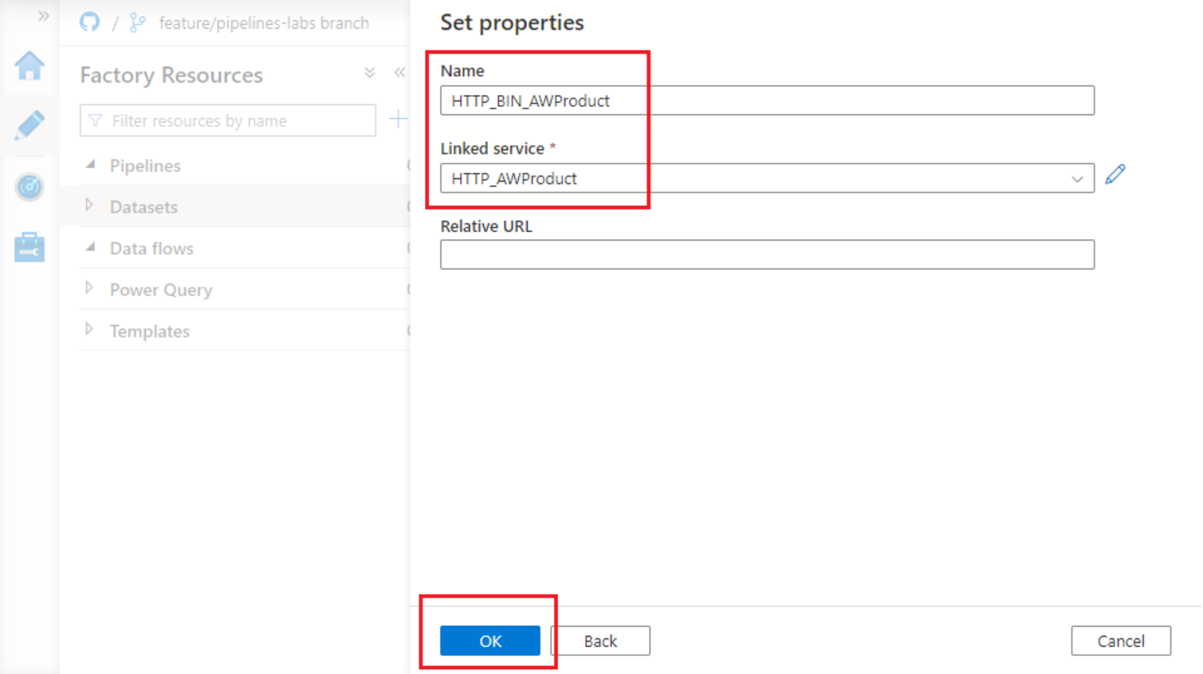
New dataset

In pipeline activities and data flows, reference a dataset to specify the location and structure of your data within a data store. Learn more

Select a data store: http

3. Choose the “Binary” format from the “Select format” page – you can use this format to copy any file, whatever its type or structure. The file we will be copying contains text-based tabular data, but at this point we are providing no information about its internal structure.

4. Name the dataset “HTTP_BIN_AWProduct”, then select the linked service you created in the previous lab. Leave “Relative URL” blank, then click “OK”.



Set properties

Name: HTTP_BIN_AWProduct

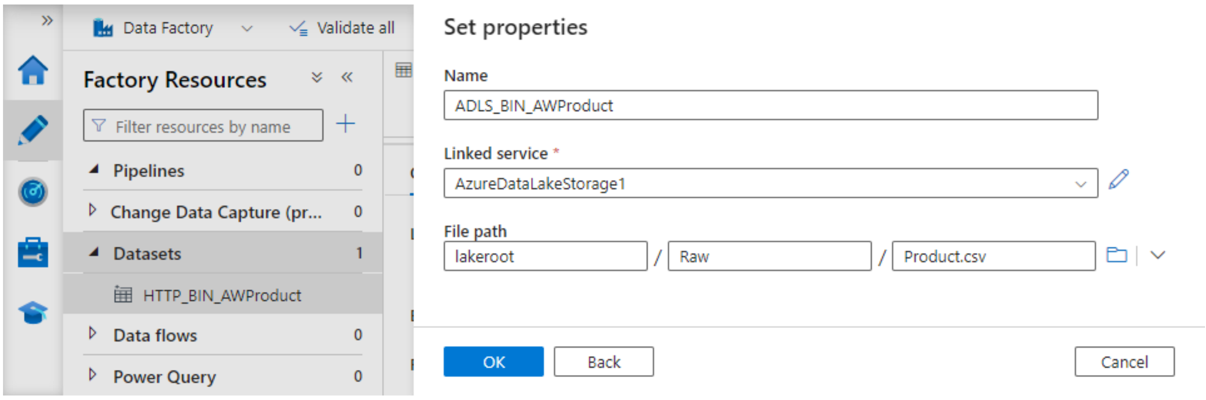
Linked service *: HTTP_AWProduct

Relative URL:

5. Repeat steps 2-4 to create a second dataset, this time to represent the sink file to be written into the data lake.

- Choose the “Azure Data Lake Storage Gen2” data store.
- Choose the “Binary” file format.
- Name the dataset “ADLS_BIN_AWProduct”, then select the data lake linked service you created in Lab 1.

- Specify the location (file path) into which you want the file to be copied. Use the “lakeroot” file system (container) created in Lab 1, the “Raw” directory, and set “File name” to “Product.csv” (consistent with the source URL used in Lab 2.1).



Set properties

Name
ADLS_BIN_AWProduct

Linked service *
AzureDataLakeStorage1

File path
lakeroot / Raw / Product.csv

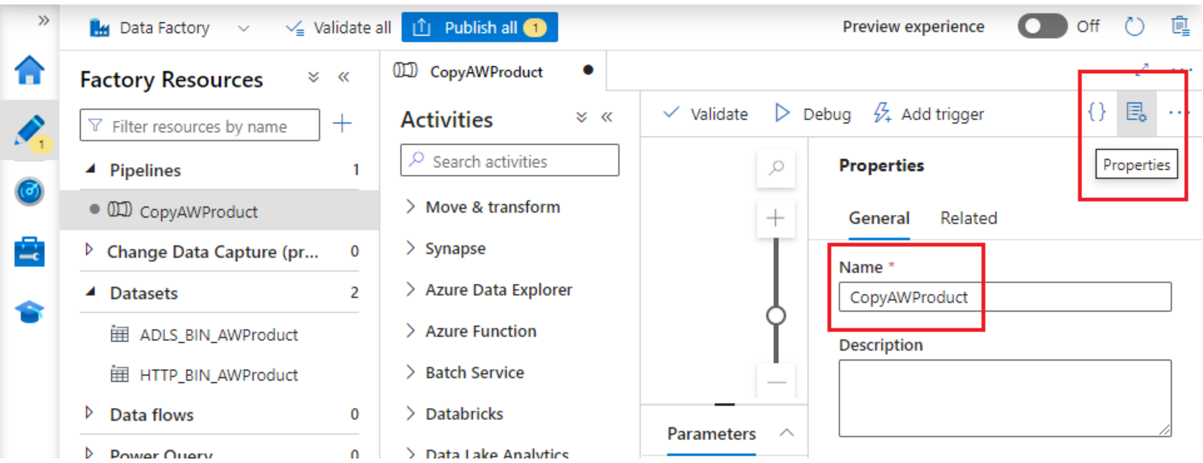
6. Click “OK” to close the flyout, then “Publish all” in the ADF Studio header bar to save your changes.

Lab 2.3 – Create copy pipeline

In this section you will create a **pipeline** that copies data from the source dataset and into the sink dataset, both of which you created in Lab 2.2.

1. Open the “Pipelines Actions” menu in the same way you accessed the “Dataset Actions” menu, by clicking the ellipsis to the right of “Pipelines” in the “Factory Resources” menu.

2. Select “New pipeline”. A new pipeline opens in the tabbed authoring canvas to the right, and the pipeline’s “Properties” flyout appears. Name the pipeline appropriately using the “Properties” flyout, then click the “Properties” toggle button to dismiss the flyout.

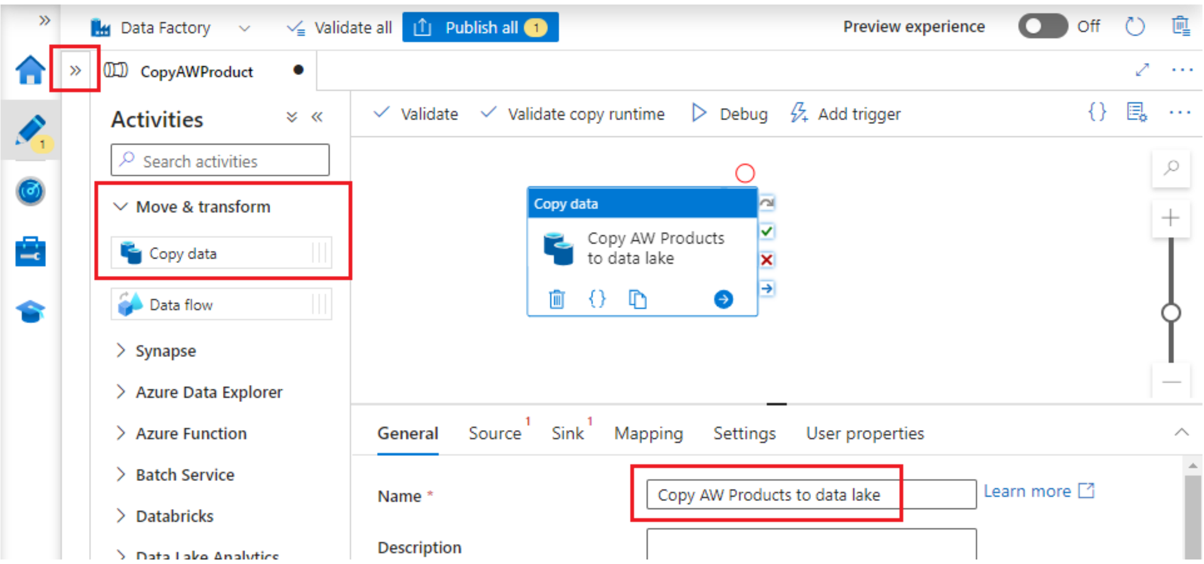


Properties

Name *
CopyAWProduct

Description

3. If you need more space, collapse the “Factory Resources” sidebar using the left chevron button. Drag a “Copy” **activity** from the “Move & transform” section of the Activities toolbox and drop it onto the pipeline canvas. Give the activity a meaningful name.



4. Select the “Source” tab below the canvas and select the “HTTP_BIN_AWProduct” dataset from the “Source dataset” dropdown.

5. Select the “Sink” tab and select the “ADLS_BIN_AWProduct” dataset from the “Sink dataset” dropdown.

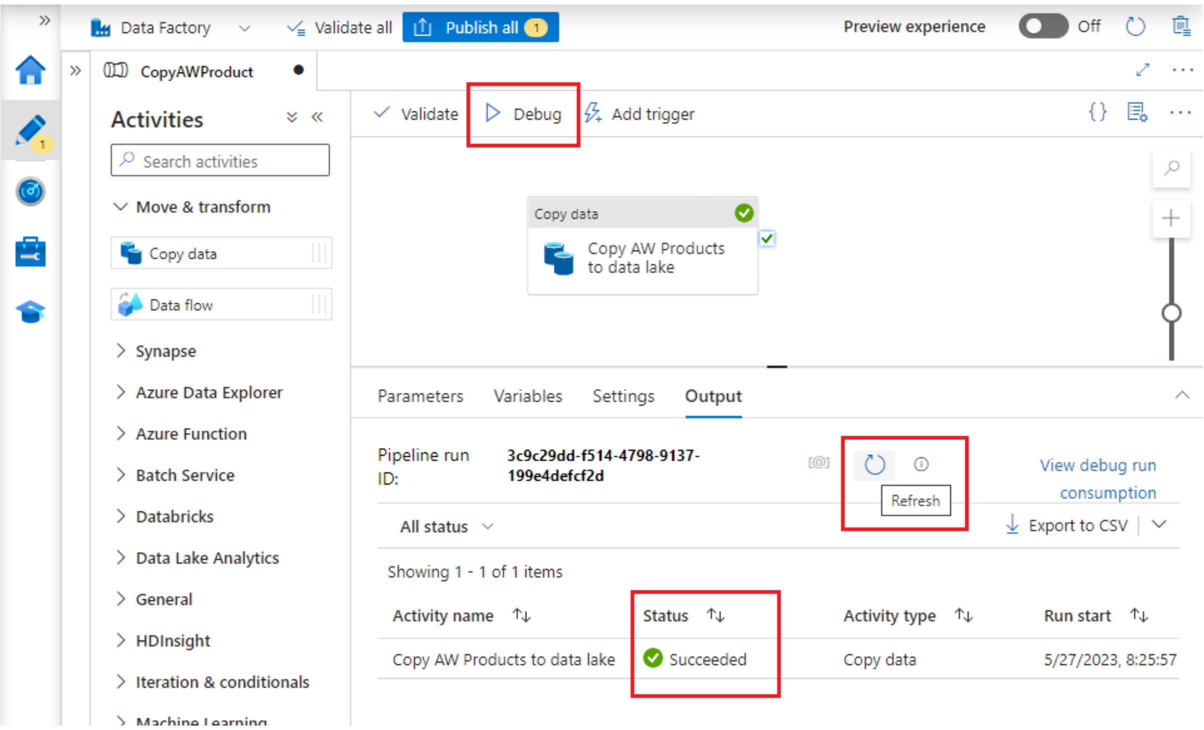
6. Finally, check your pipeline configuration by clicking the “Validate” button above the pipeline canvas.

Lab 2.4 – Debug and test the pipeline

You can test your pipeline’s execution and outcome by running it in “Debug” mode in ADF Studio.

1. Click “Debug” above the pipeline canvas. The pipeline’s “Output” pane appears below the canvas.

2. The “Output” pane contains a row for each of the pipeline’s activity executions – in this case just one, for the Copy data activity. The row shows the execution’s current status. While the pipeline is running, you can get status updates using the “Refresh” button.

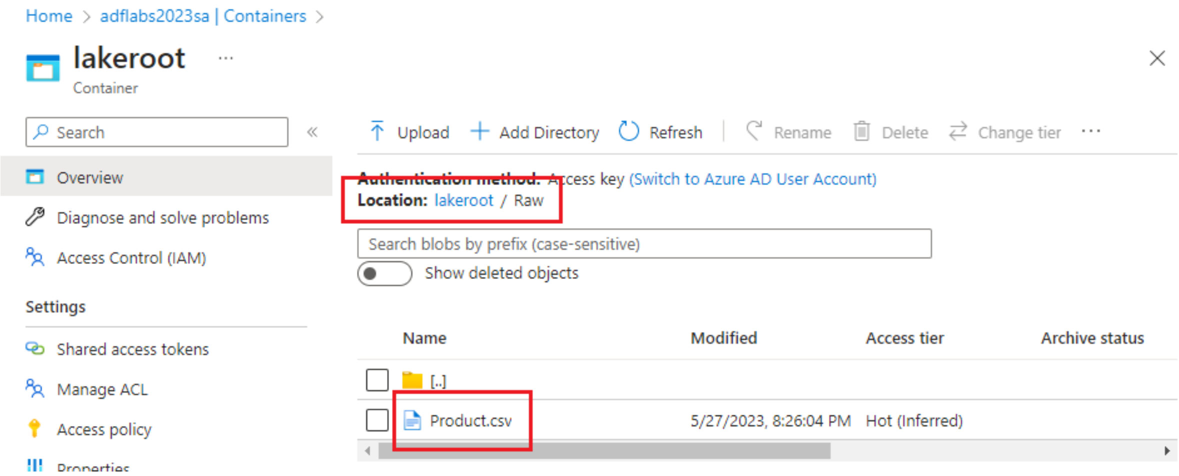


Pipeline run ID: 3c9c29dd-f514-4798-9137-199e4defcf2d

Showing 1 - 1 of 1 items

Activity name	Status	Activity type	Run start
Copy AW Products to data lake	✓ Succeeded	Copy data	5/27/2023, 8:25:57

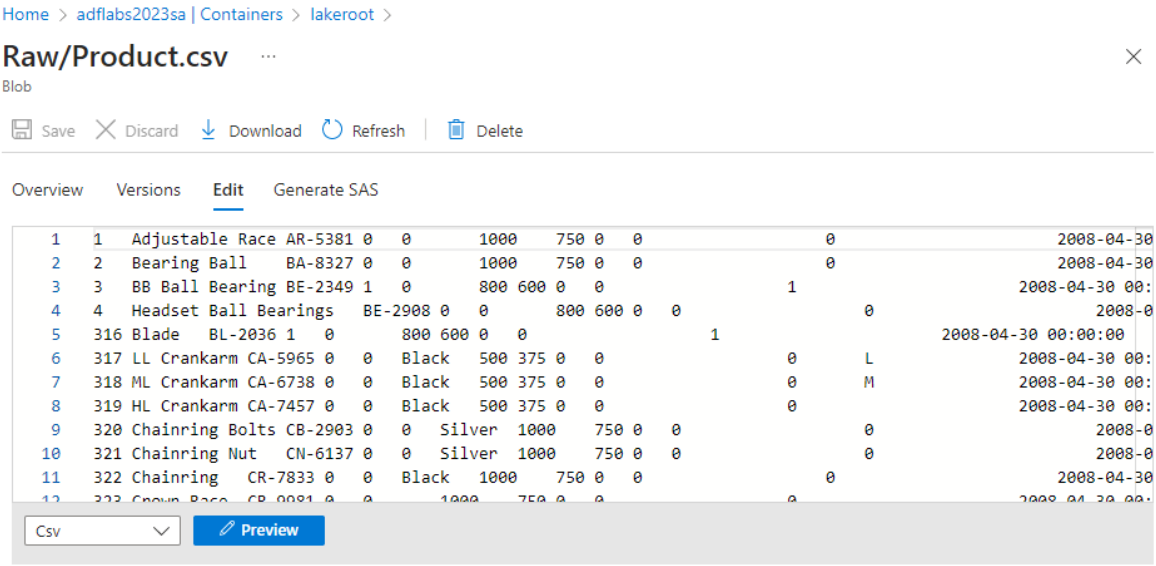
3. “Debug” runs your pipeline without publishing it to the data factory instance, but its effect is just the same – it has the same external dependencies, so has real effects on external resources. Open the “Raw” folder in the Azure portal and you will see the newly copied file “Products.csv”.



Authentication method: Access key (Switch to Azure AD User Account)
Location: lakeroot / Raw

Name	Modified	Access tier	Archive status
□ [..]			
□ Product.csv	5/27/2023, 8:26:04 PM	Hot (Inferred)	

4. To inspect its contents, click the filename to open the “Blob” blade, then select the “Edit” tab.



```
1   Adjustable Race AR-5381 0   0       1000    750 0   0                       0                           2008-04-30
2   Bearing Ball    BA-8327 0   0       1000    750 0   0                       0                           2008-04-30
3   BB Ball Bearing BE-2349 1   0       800 600 0   0                       1                           2008-04-30 00:
4   Headset Ball Bearings   BE-2908 0   0       800 600 0   0                       0                           2008-0
316 Blade   BL-2036 1   0       800 600 0   0                       1                           2008-04-30 00:00:00
317 LL Crankarm CA-5965 0   0   Black   500 375 0   0                       0       L                   2008-04-30 00:
318 ML Crankarm CA-6738 0   0   Black   500 375 0   0                       0       M                   2008-04-30 00:
319 HL Crankarm CA-7457 0   0   Black   500 375 0   0                       0                           2008-04-30 00:
320 Chainring Bolts CB-2903 0   0   Silver  1000    750 0   0                       0                           2008-0
321 Chainring Nut   CN-6137 0   0   Silver  1000    750 0   0                       0                           2008-0
322 Chainring   CR-7833 0   0   Black   1000    750 0   0                       0                           2008-04-30
323 Crown Race  CR-9981 0   0       1000    750 0   0                       0                           2008-04-30 00:
```

Notice that although the file has a ".csv" extension, it is not comma-separated – fields in the file are separated by tabs instead. This will be important in Lab 4.

5. Save your pipeline by publishing it to ADF.

Recap

In Lab 2 you have:

- created a linked service to connect to an external web source (GitHub)
- created datasets to represent data files in the source and in the data lake
- created a pipeline to copy the Products.csv file from GitHub and into your data lake, using the new datasets and linked services
- run the pipeline in debug mode and inspected its results.