Azure Databrics

What is Azure Databricks?

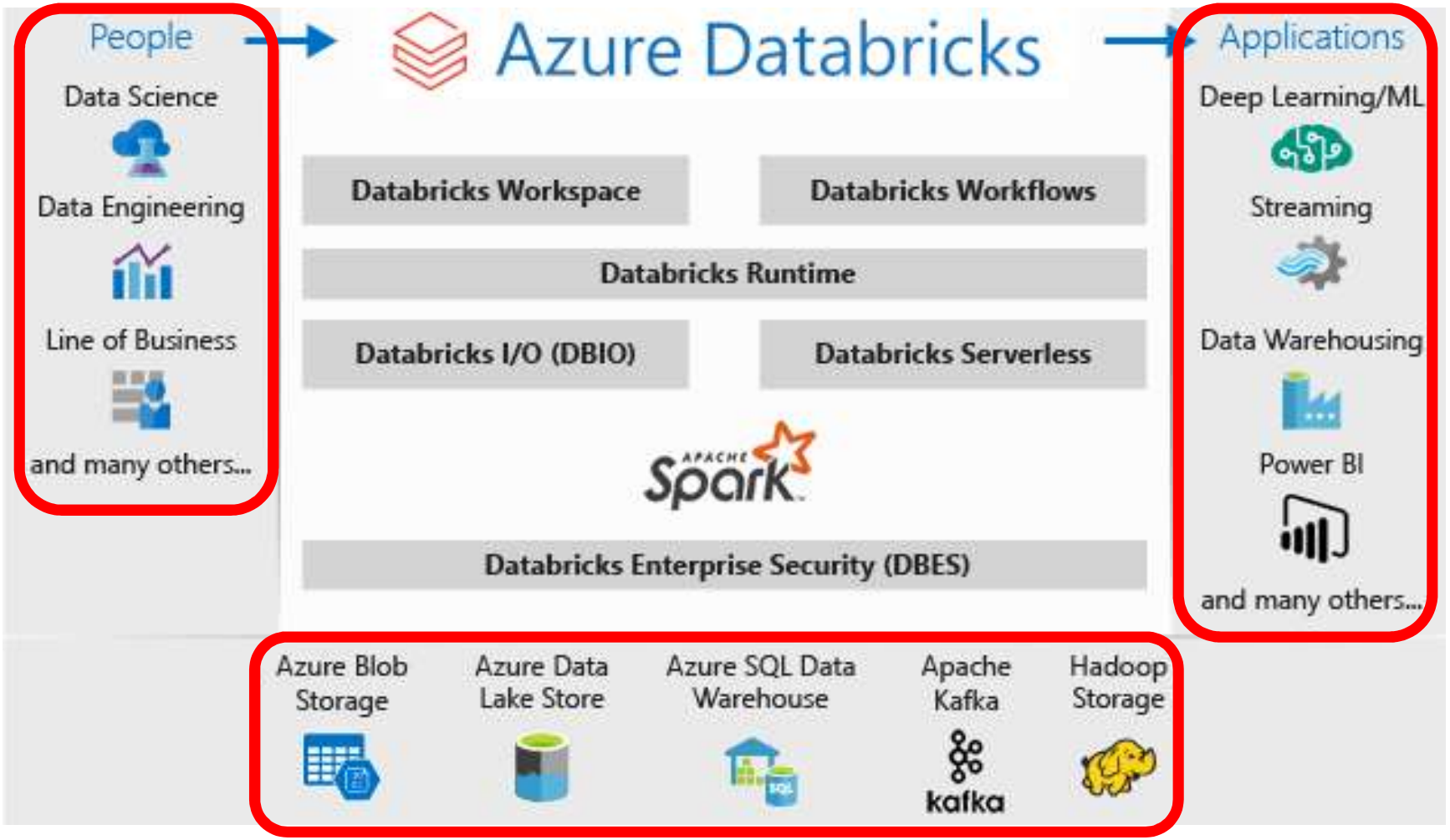
Apache Spark-based

Analytics platform

Provides

- One-click setup
- Streamlined workflows and
- An interactive workspace
- Enables collaboration between data scientists, data engineers, and business analysts.

Azure Databricks



Azure Databricks

For a big data pipeline, the data is ingested into Azure

This data lands in

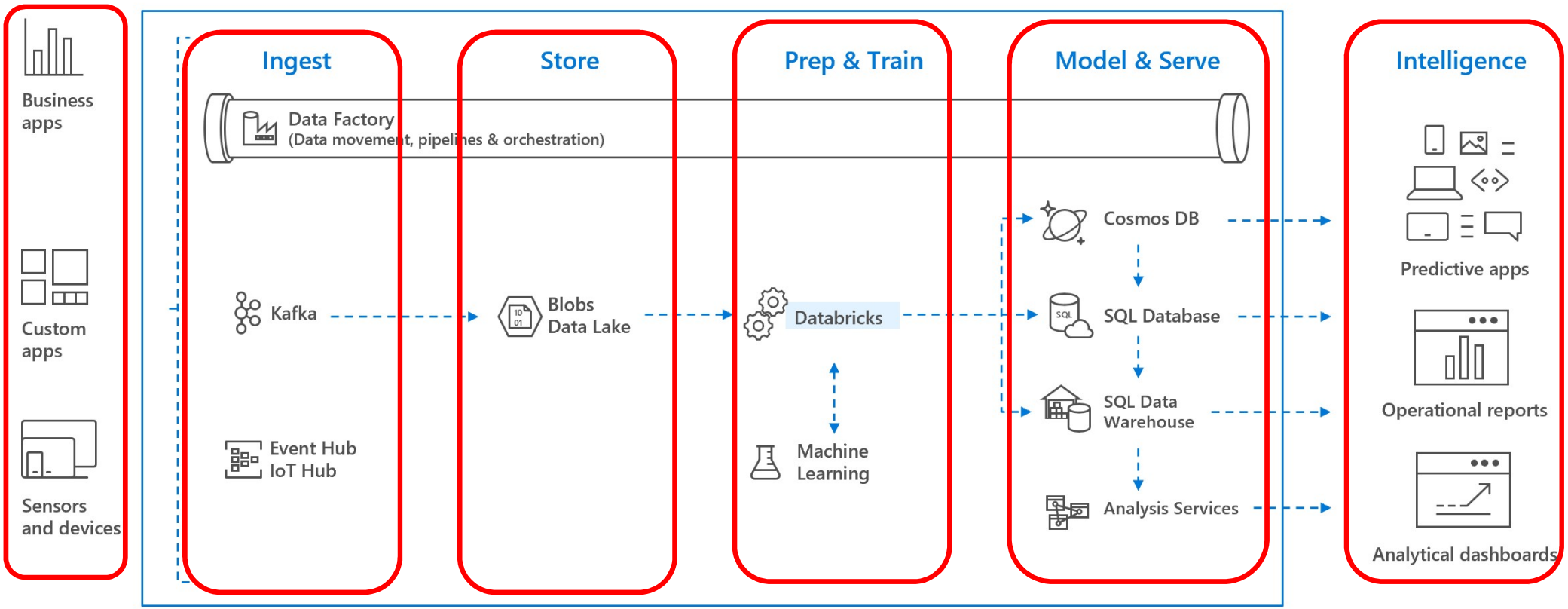
- Azure Blob Storage or
- Azure Data Lake Storage

Use Azure Databricks to read data from multiple data sources

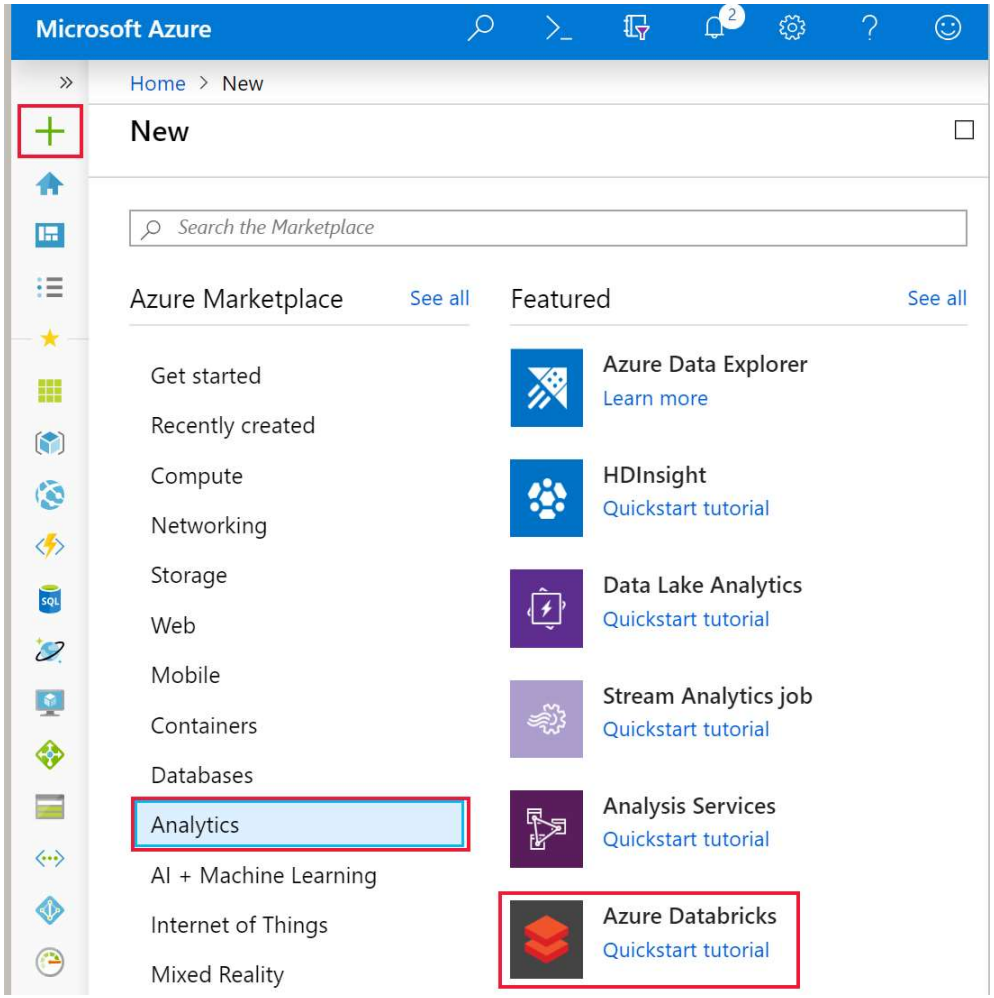
- Azure Blob Storage
- Azure Data Lake Storage
- Azure Cosmos DB, or
- Azure SQL Data Warehouse

Using Databricks, turn it into breakthrough insights

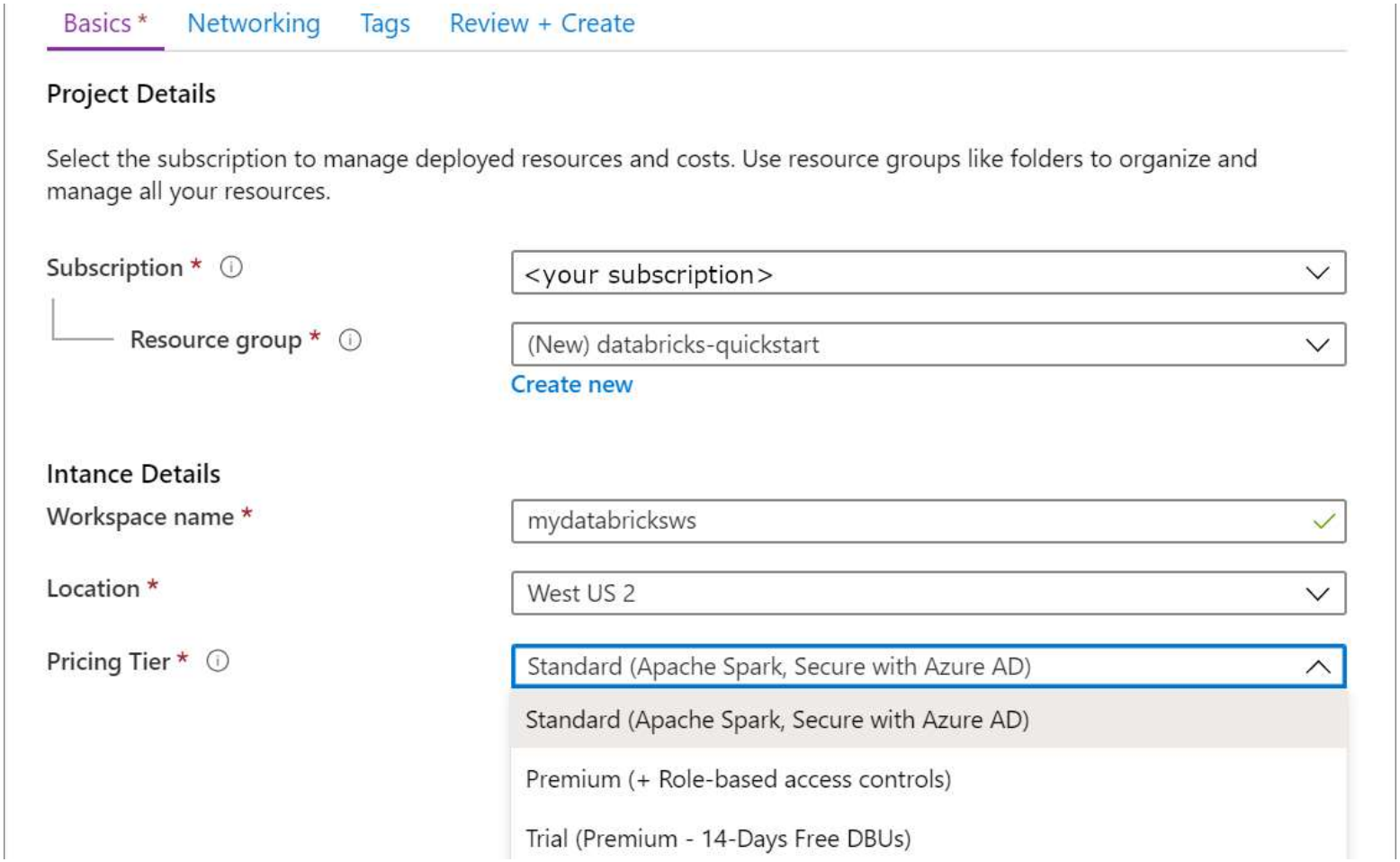
Azure Databricks



Hands-On: Create Databricks Workspace

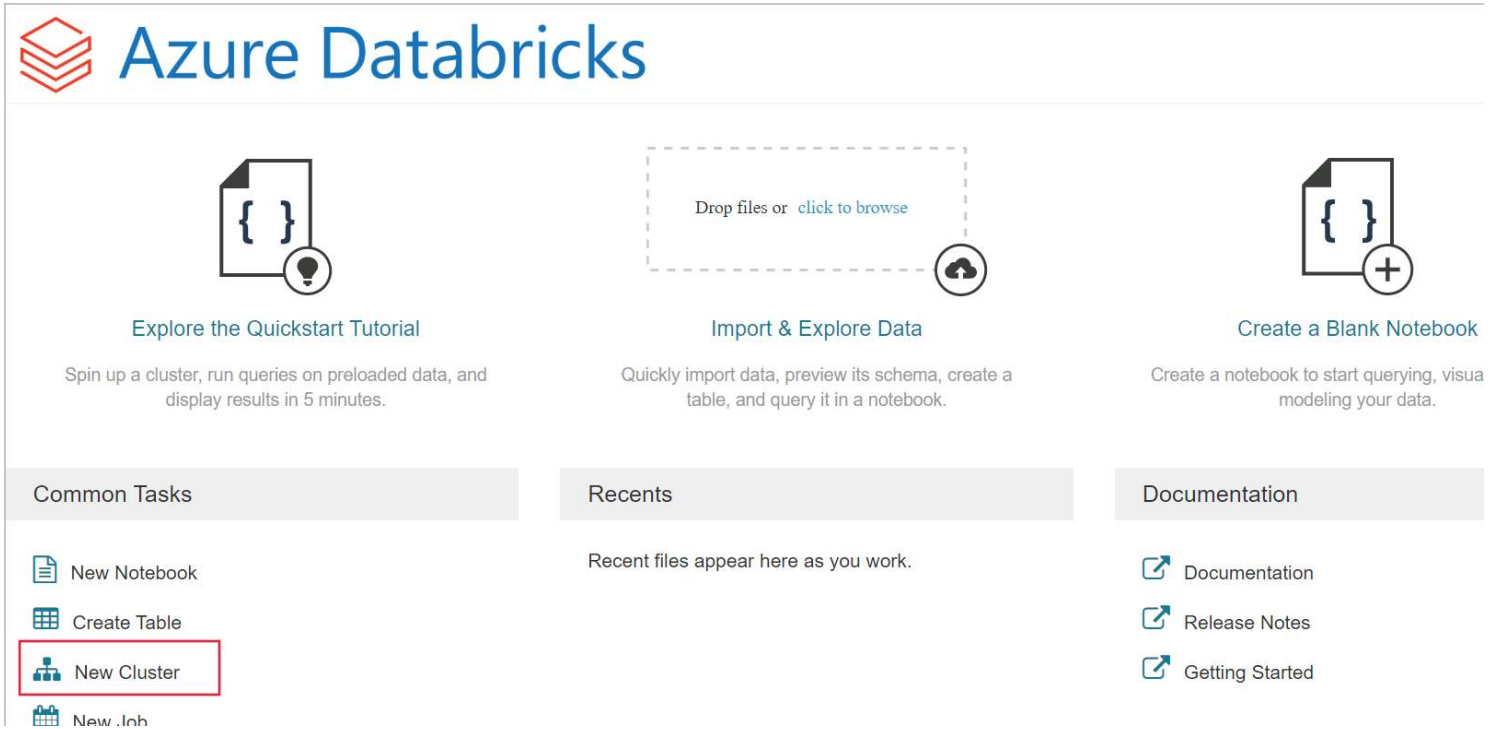


Hands-On: Create Databricks Workspace



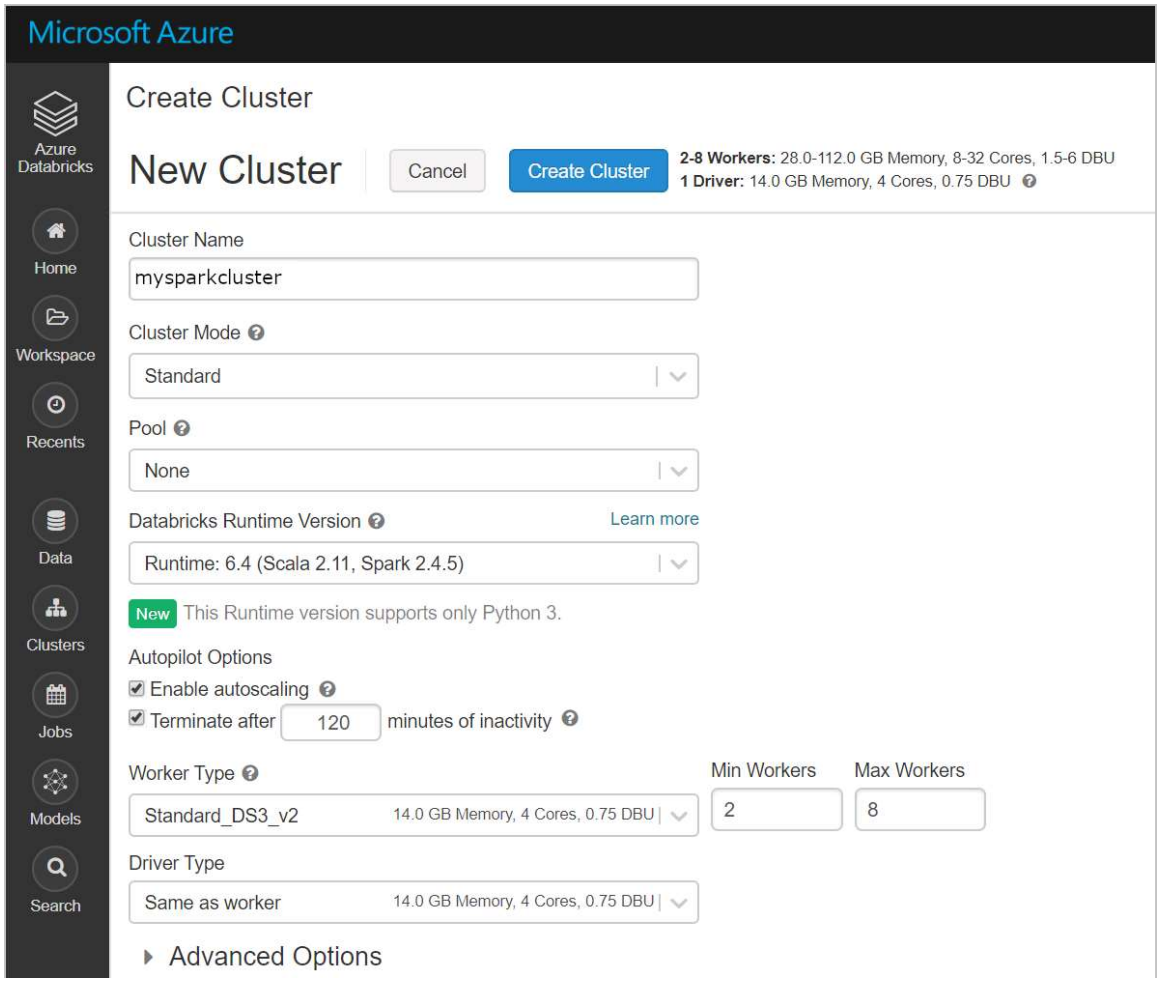
Hands-On: Create a Spark cluster in Databricks

- Go to the Databricks workspace that you created, and then click Launch Workspace.
- You are redirected to the Azure Databricks portal.
- Click New Cluster



Hands-On: Create a Spark cluster in Databricks

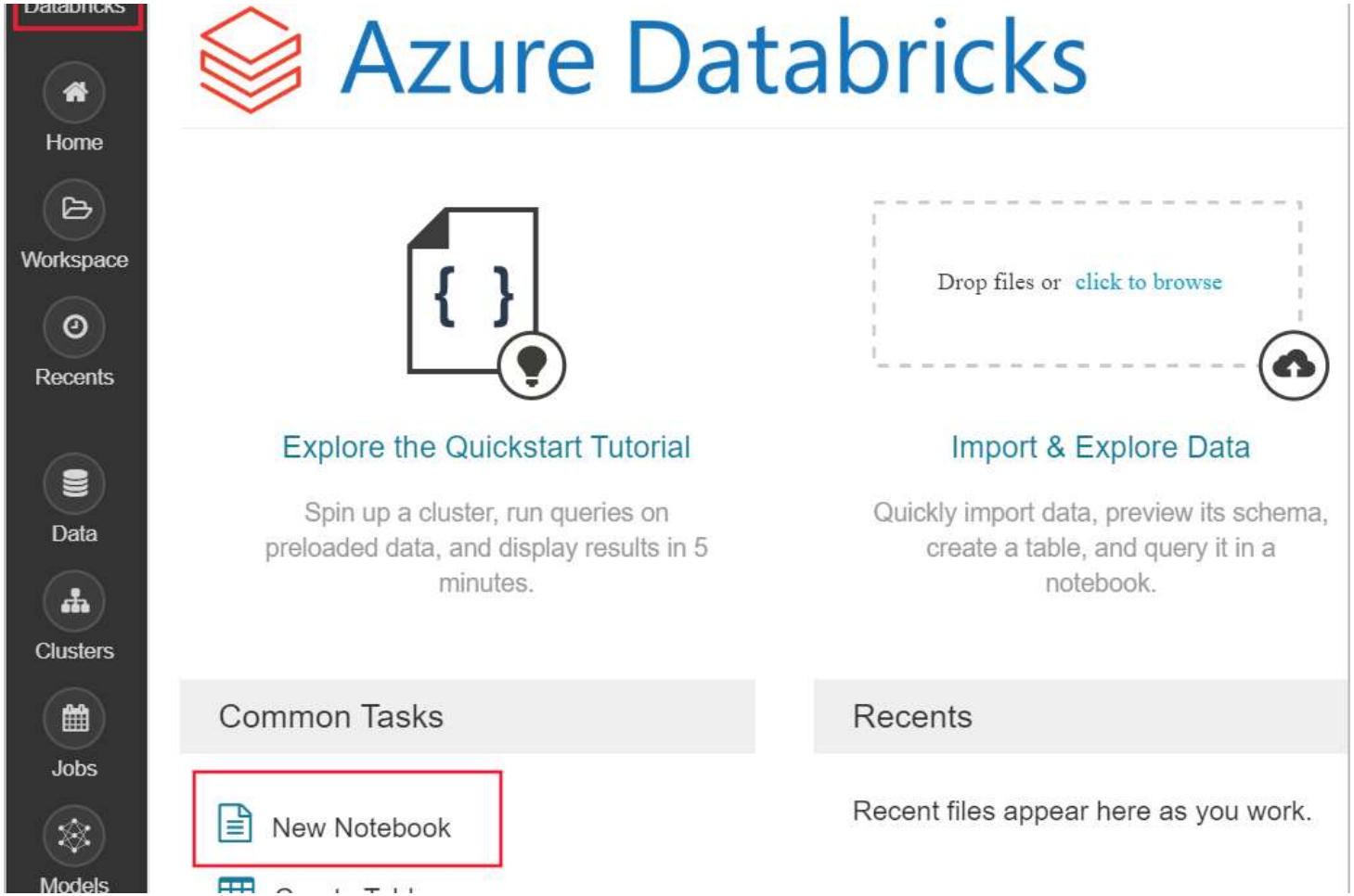
- Make sure you select the Terminate after __ minutes of inactivity checkbox
- Provide a duration (in minutes) to terminate the cluster, if the cluster is not being used.



Run a Spark SQL job

Hands-On: Run a Spark SQL job

Source Code:
atinNotebook1.ipynb



Hands-On: Run a Spark SQL job

- The following command sets the Azure storage access information.
  - blob_account_name = "azureopendatastorage"
  - blob_container_name = "citydatacontainer"
  - blob_relative_path = "Safety/Release/city=Boston"
  - blob_sas_token = r"?st=2019-02-26T02%3A34%3A32Z&se=2119-02-27T02%3A34%3A00Z&sp=rl&sv=2018-03-28&sr=c&sig=XlJVWA7fMXCSxCKqJm8psMOh0W4h7cSYO28coRqF2fs%3D"

Hands-On: Run a Spark SQL job

- The following command allows Spark to read from Blob storage remotely
  - wasbs_path = 'wasbs://%s@%s.blob.core.windows.net/%s' % (blob_container_name, blob_account_name, blob_relative_path)
  - spark.conf.set('fs.azure.sas.%s.%s.blob.core.windows.net' % (blob_container_name, blob_account_name), blob_sas_token)
  - print('Remote blob path: ' + wasbs_path)

Hands-On: Run a Spark SQL job

- The following command creates a DataFrame
  - df = spark.read.parquet(wasbs_path)
  - print('Register the DataFrame as a SQL temporary view: source')
  - df.createOrReplaceTempView('source')

Hands-On: Run a Spark SQL job

- Run a SQL statement return the top 10 rows of data
  - print('Displaying top 10 rows: ')
  - display(spark.sql('SELECT * FROM source LIMIT 10'))

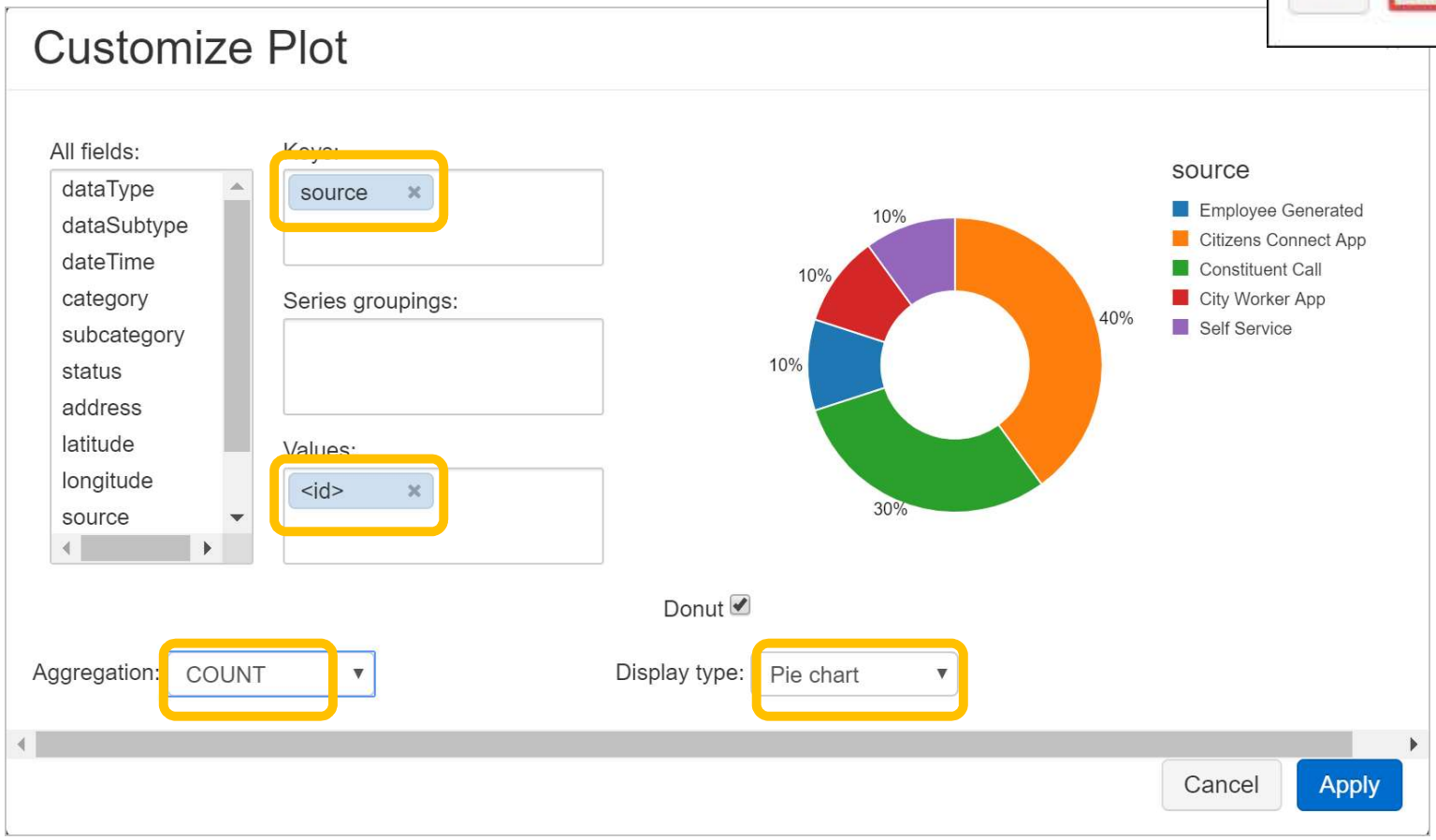
```
1 print('Displaying top 10 rows: ')
2 display(spark.sql('SELECT * FROM source LIMIT 10'))
```

▸ (1) Spark Jobs

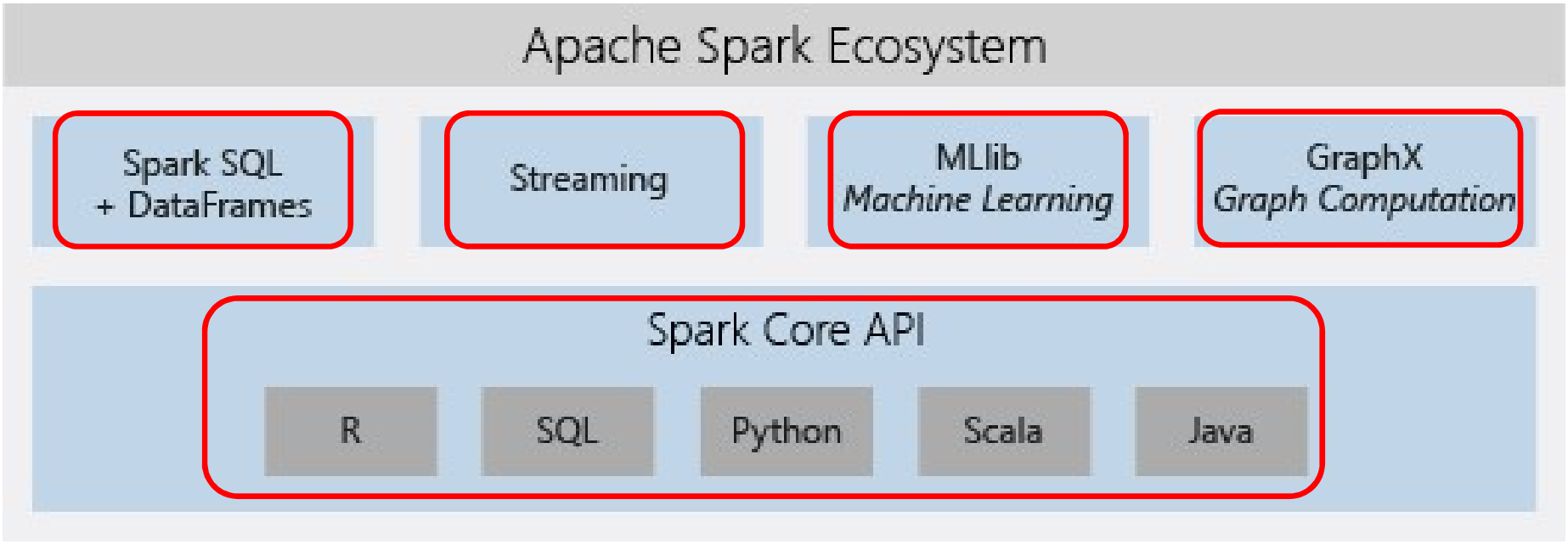
dataType	dataSubtype	dateTime	category	subcategory	status	address	latitude	longitude	source	extendedProperties
Safety	311_All	2011-08-11T11:02:16.000+0000	Recycling	Request for Recycling Cart	Closed	43 Howell St Dorchester MA 02125	42.3255	-71.0587	Employee Generated	null
Safety	311_All	2016-12-15T09:08:21.000+0000	Street Cleaning	Pick up Dead Animal	Closed	74 Aldie St Allston MA 02134	42.3588	-71.1335	Citizens Connect App	null
Safety	311_All	2017-01-26T18:45:00.000+0000	Enforcement & Abandoned Vehicles	Parking Enforcement	Closed	98 Waltham St Roxbury MA 02118	42.3436	-71.0713	Constituent Call	null

Hands-On: Run a Spark SQL job

- You now create a visual representation of this data



Apache Spark-based analytics platform



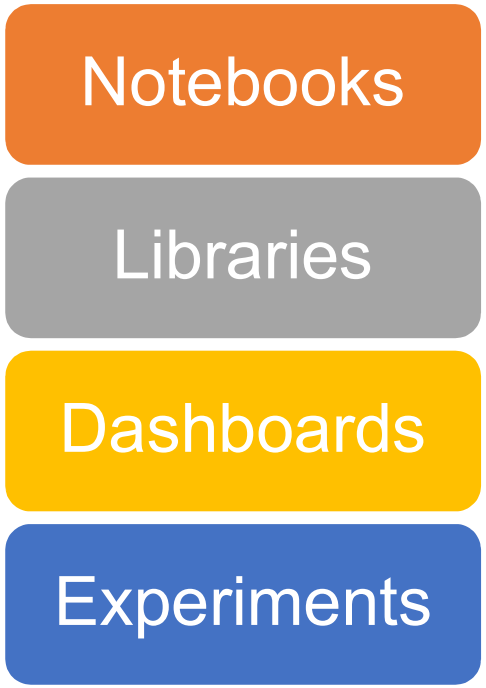
Azure Databricks concepts

Azure Databricks concepts

Workspace

- Environment for accessing all of your Azure Databricks assets.
- Organizes objects into folders

Objects



Notebook

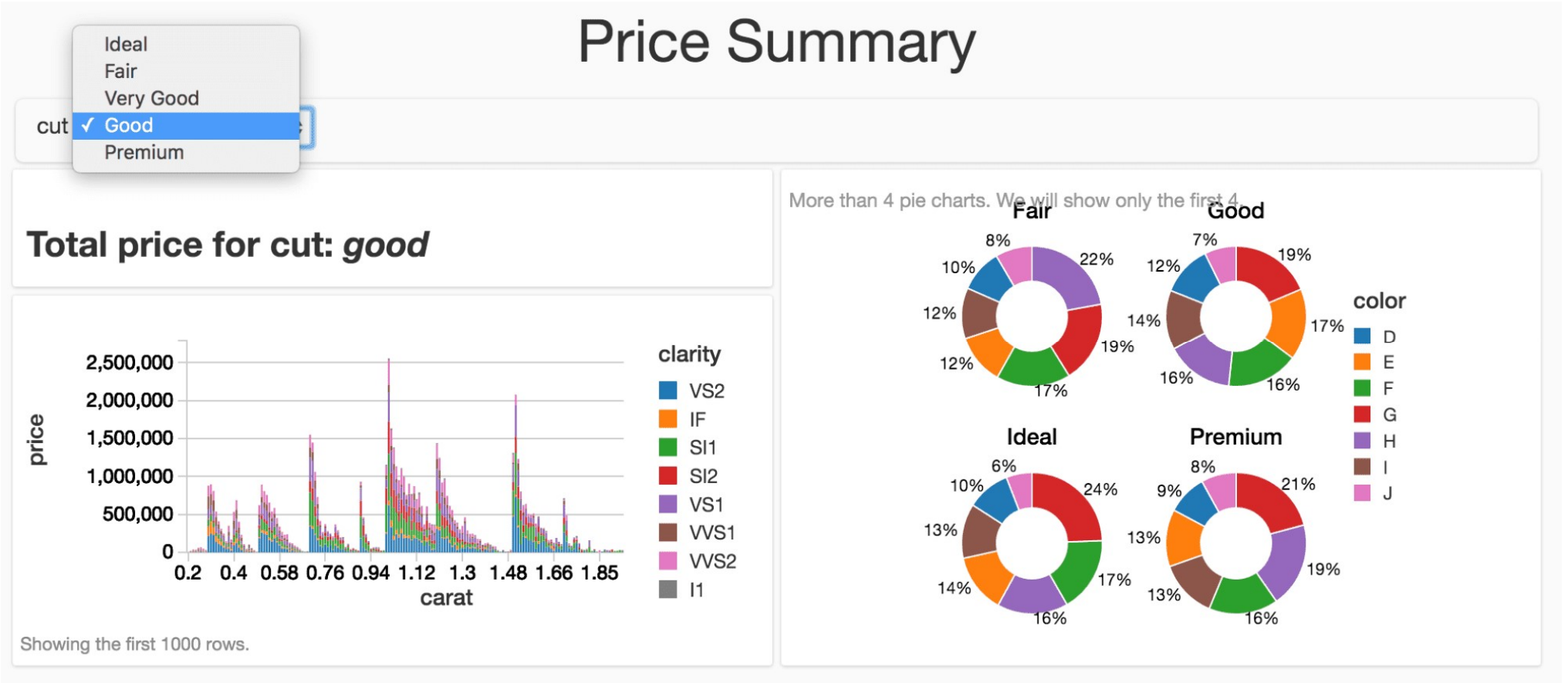
A web-based interface for documents

Document contain

- Runnable commands
- Visualizations, and
- Narrative text.

Dashboard

- Provides access to visualizations

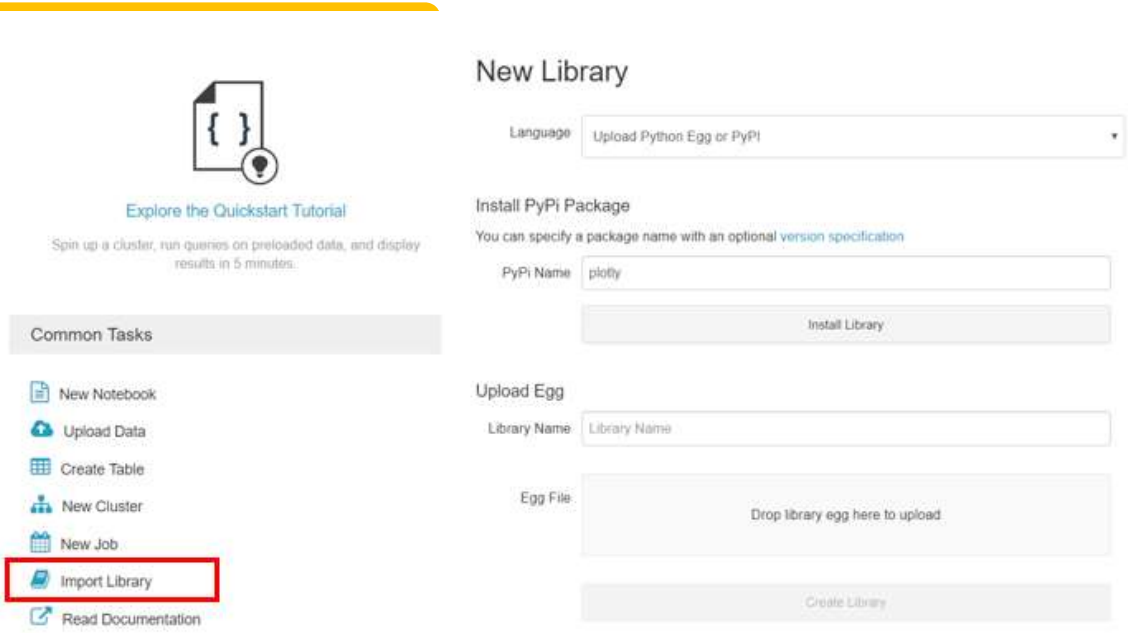


Library

A package of code available to the notebook

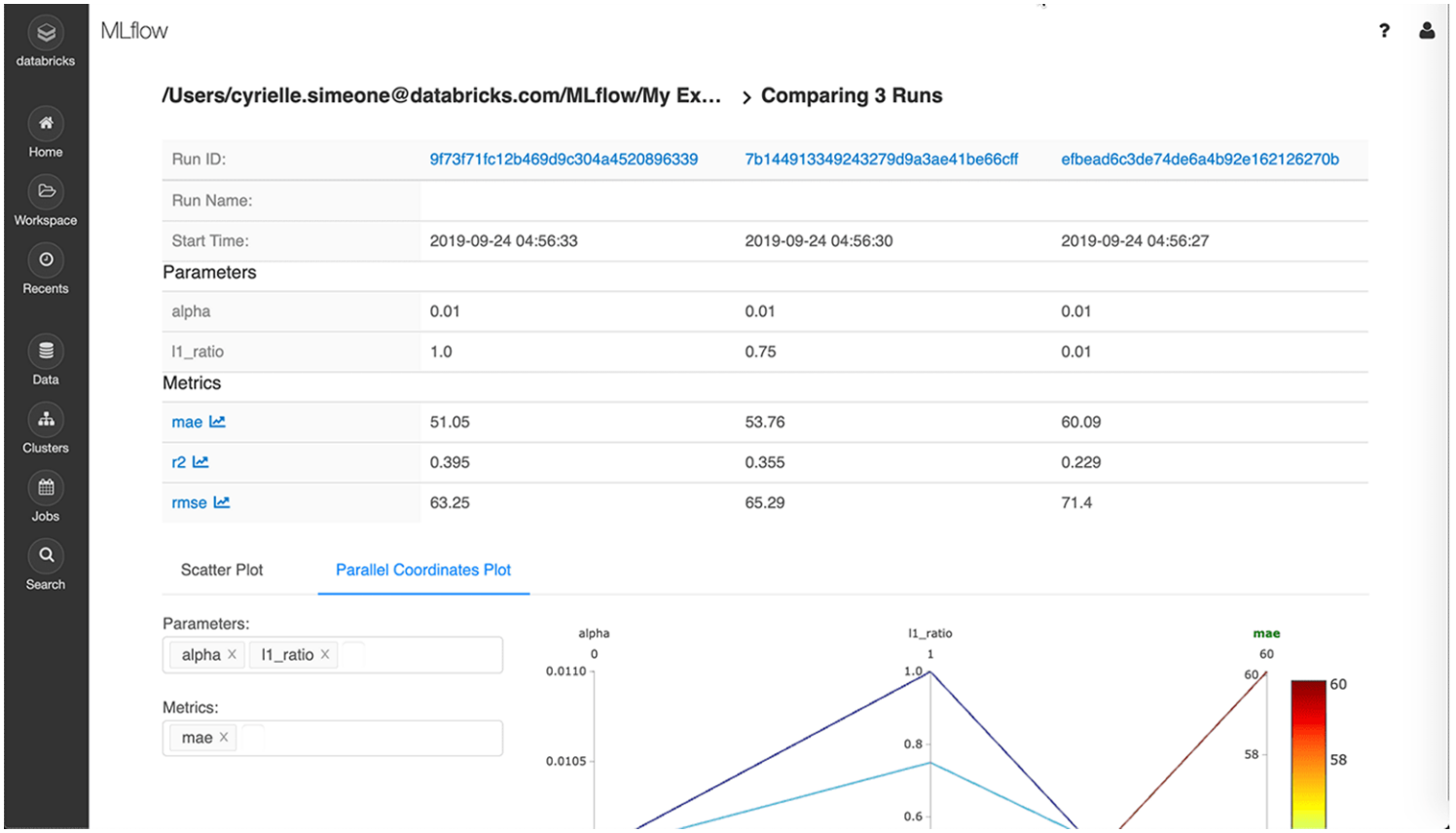
Databricks runtimes include many libraries

You can add your own.



Experiment

- A collection of MLflow runs for training a machine learning model.



Authentication and authorization

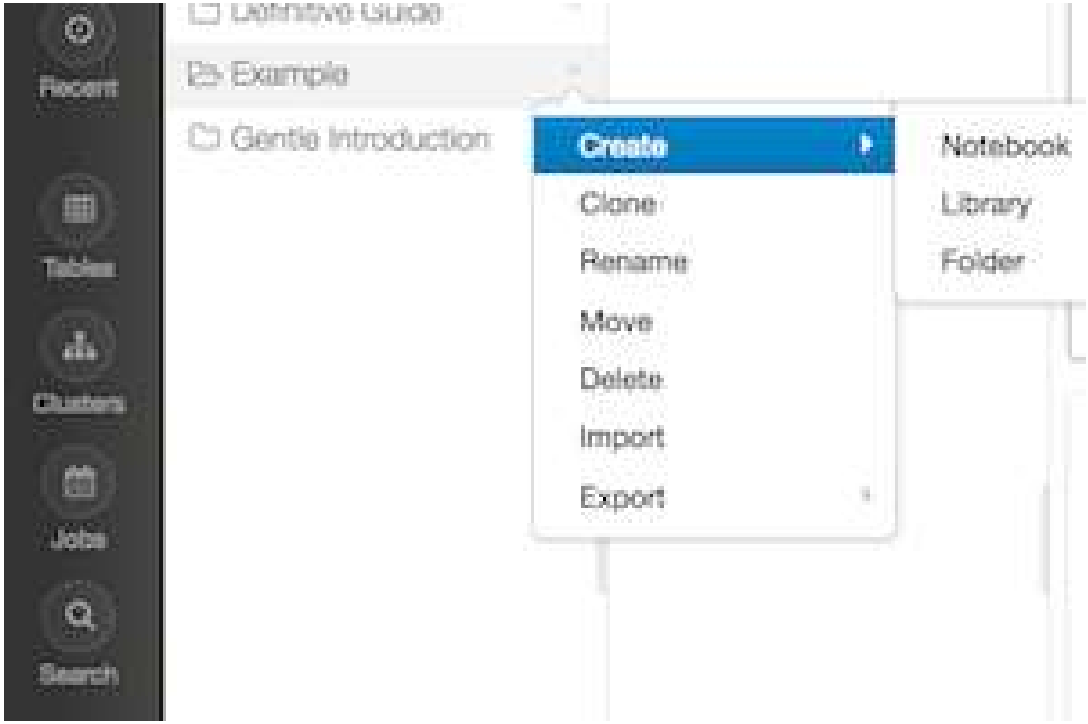
User	• A unique individual who has access to the system.
Group	• A collection of users.
Access control list (ACL)	• A list of permissions attached to the objects. • Specifies which users or system processes are granted access to the objects

Work with Notebooks

What is Notebook?

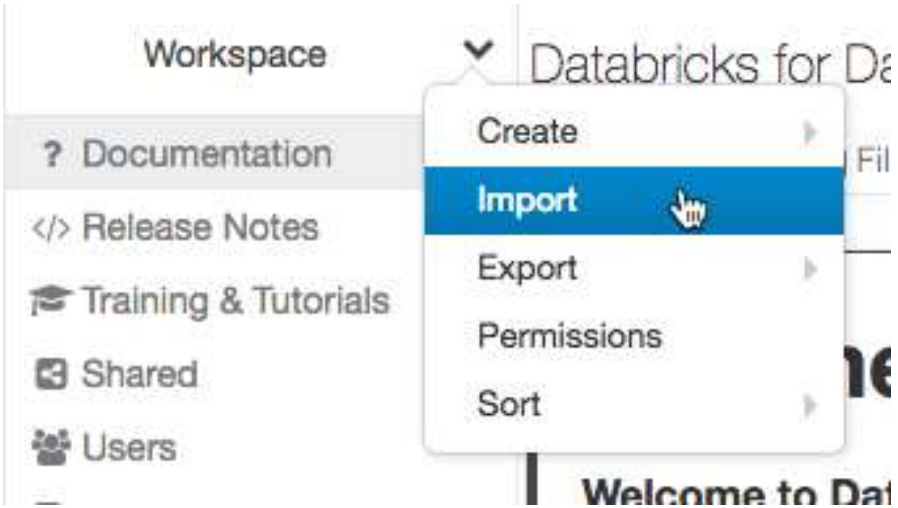
- A web-based interface to a document that contains
  - Runnable code
  - Visualizations, and
  - Narrative text

Hands-On: Create a notebook



Hands-On

- Open a Notebook
- Delete a Notebook
- Rename a notebook
- Import a notebook
- Export a notebook



Hands-On: Notebooks and clusters

- Before you can do any work in a notebook, you must first attach the notebook to a cluster
- Attach a notebook to a cluster
- Detach a notebook from a cluster
- View all notebooks attached to a cluster
- Schedule a notebook

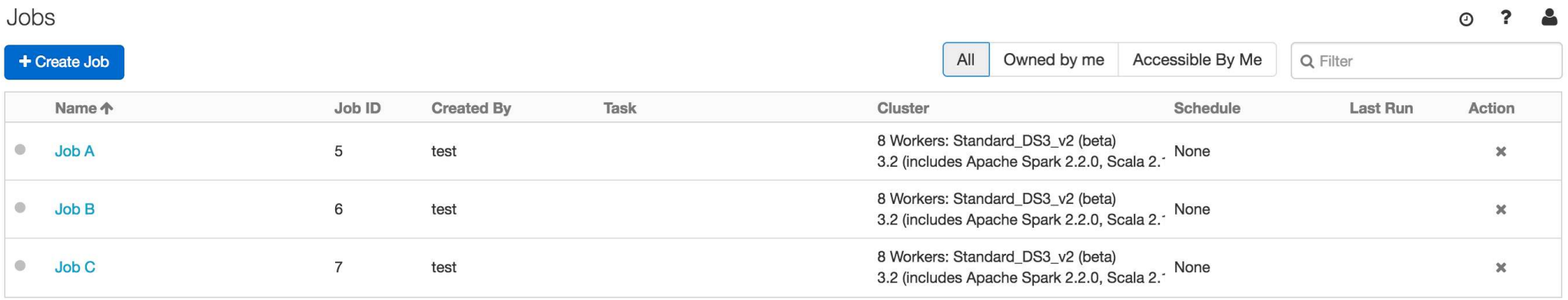
Work with Jobs

What is a Job?

- A way of running a notebook on a scheduled basis
- Can create and run jobs using the
  - UI
  - CLI
  - By invoking the Jobs API

View jobs

- Click the Jobs icon Jobs Menu Icon in the sidebar



Hands-On: Create a job

Hands-On: Run a job

- Schedule a job
- Pause and resume a job schedule
- Run a job immediately

Hands-On: View job run details

Library dependencies

- To get the full list of the driver library dependencies, run the following command inside a notebook
  - %sh
  - ls /databricks/jars

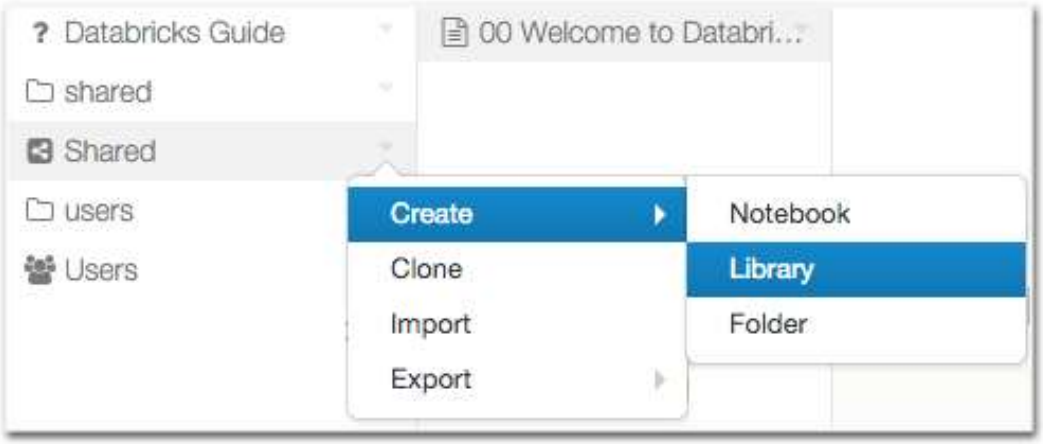
Libraries Overview

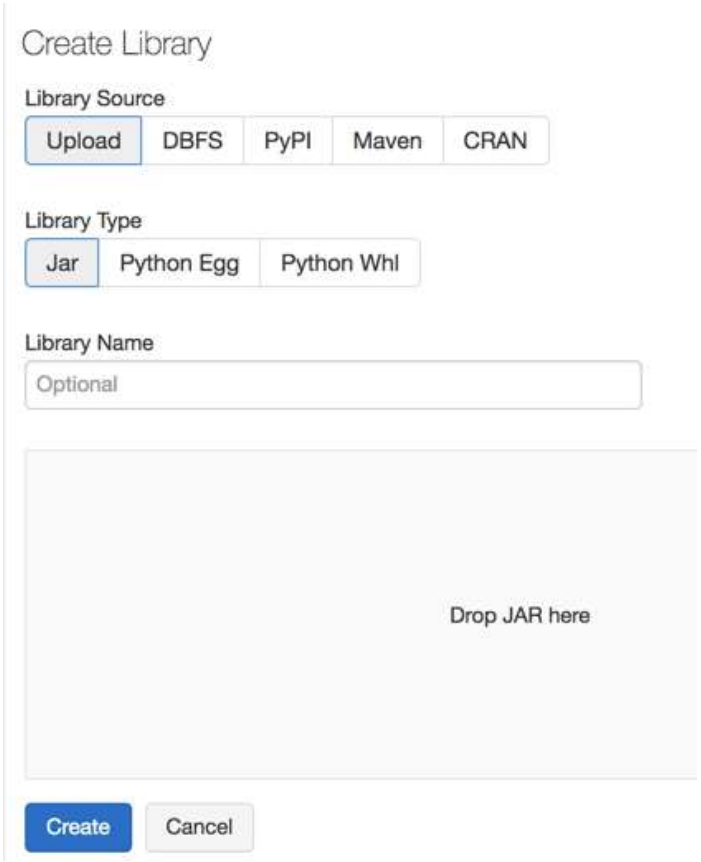
Libraries Overview

- To make third-party or custom code available to notebooks and jobs running on your clusters, you can install a library.
- Libraries can be installed using:
  - Workspace libraries
    - Serve as a local repository from which you create cluster-installed libraries
  - Cluster libraries
    - Can be used by all notebooks running on a cluster
    - Can install a cluster library directly from a public repository such as PyPI
  - Notebook-scoped Python libraries
    - Allow to install Python libraries and create an environment scoped to a notebook session
    - These libraries do not persist and must be re-installed for each session.

Hands-On: Create a workspace library

- Right-click the workspace folder where you want to store the library.
- Select Create > Library.





Hands-On: Install a library on a cluster

- Two ways to install a library on a cluster:
  - Install a workspace library that has been already been uploaded to the workspace.
  - Install a library for use with a specific cluster only


thanks