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|  | Databricks & Custom Vision  using Microsoft Azure |

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| Overview |

### Summary

This lab explores Azure Databricks and shows how to use it for various purposes and products.

### Learning Objectives

Upon completing this lab, you will have hands-on experience with the following functions and concepts related to Big Data:

* Setting up your Azure Databricks Account
* Creating A Cluster
* Working With Spark API
* Working With SQL Api
* Developing an Image Classification Model using Custom Vision

### Lab Requirements/Prerequisites

* A Microsoft account is required to obtain a Databricks Cluster. Since you will need minimum 12 cores, free and azurepass sıbscriptions will not work. If you don’t already have a Microsoft account, you can obtain one for free from the following link:

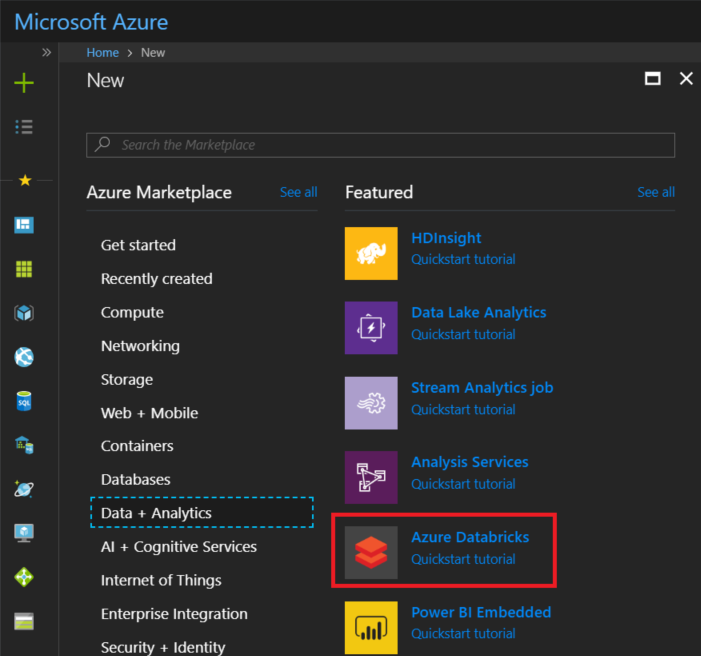
<https://www.microsoft.com/en-us/account/default.aspx>

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| What is Azure Databricks ? |

### What is Azure Databricks?

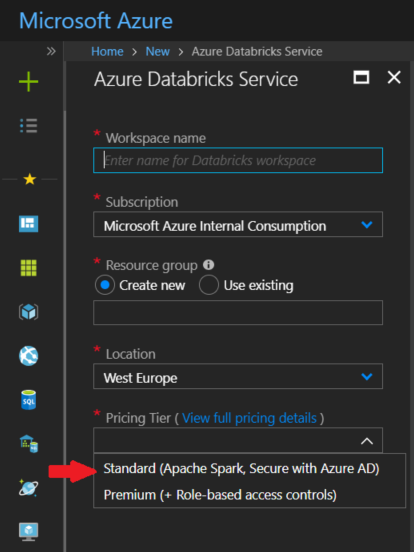
Azure Databricks is a fast, easy, and collaborative Apache Spark-based analytics platform. The diagram below explains its core pillars and key differentiators. In this lab we’ll explore Data Engineering capabilities of Azure Databricks:.

1. Open Google Chrome Browser (Azure Databricks visualizations work better with Chrome)
2. Log in to the Azure portal at http://portal.azure.com using your @microsoft.com address. It is important that your account has an AAD identity as Azure Databricks has built-in security, and needs the AAD token. o Do not use the Ready subscriptions, if you want to persist the assets.
3. In the Azure portal, click +, click Data + Analytics, and then click Azure Databricks (Preview). Once the **Cognitive Services** homepage is loaded, select the **APIs** drop-down me



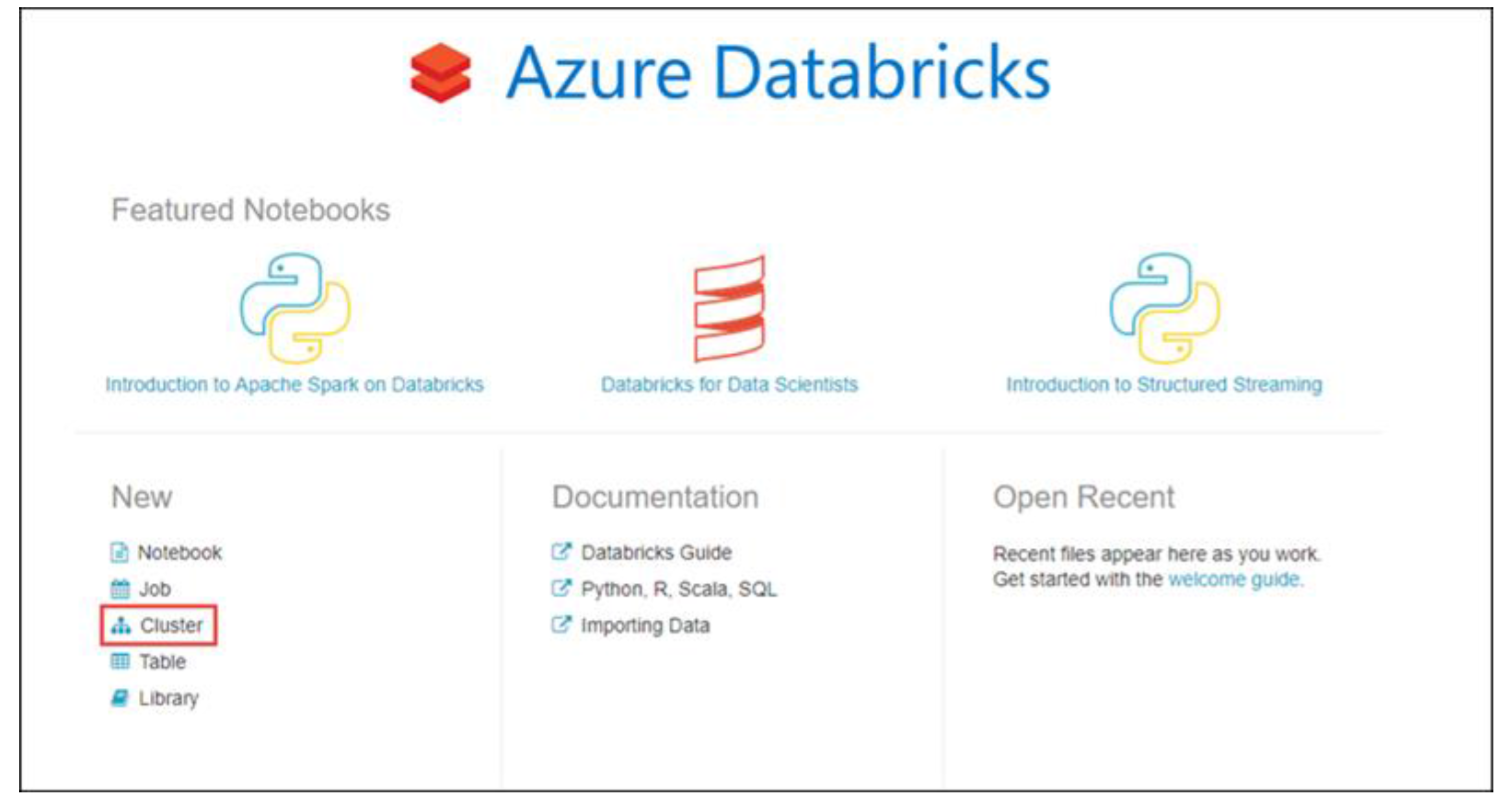
1. Under Azure Databricks, click Create.
2. Under Azure Databricks Service, provide the following values:
   * For Workspace name, provide a name for your Databricks workspace.
   * For Subscription, from the drop-down, select your Azure subscription.
   * For Resource group, specify whether you want to create a new resource group or use an existing one. A resource group is a container that holds related resources for an Azure solution. And it is a convenient way to remove the resources with its all peripherals.
   * For Location, select the closest region. For other available regions, see Azure services available by region.

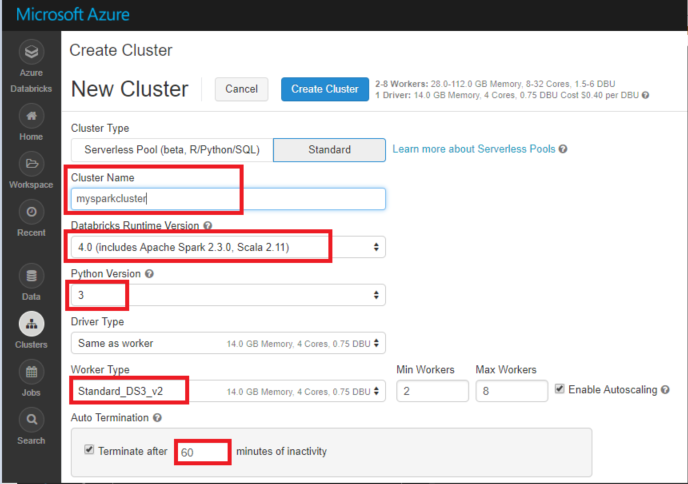
6. Click Create.



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| Create a Spark cluster |

**Create a Spark cluster in Databricks**

1. In the Azure portal, go to the Databricks workspace that you created, and then click Initialize Workspace.
2. You are redirected to the Azure Databricks portal. From the portal, click Cluster. 
3. In the New cluster page, provide the values to create a cluster.



* Enter a name for the cluster.
* Make sure you select the Terminate after \_ minutes of activity checkbox. Provide a duration (in minutes) to terminate the cluster, if the cluster is not being used.
* Accept all other default values.
* Click Create cluster.

Once the cluster is in running state, you can attach notebooks to the cluster and run Spark jobs.

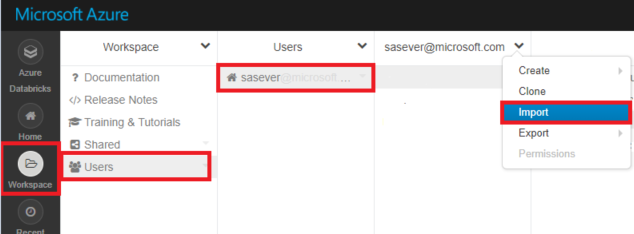
While the cluster is creating (it takes about 5 mins.), feel free to read into this clog post for a technical overview of Azure Databricks: https://azure.microsoft.com/en-us/blog/a-technical-overview-of-azure-databricks/

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| Running Spark Jobs |

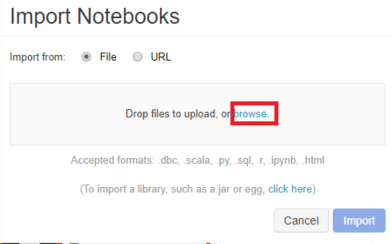
**Running Spark Jobs**

Perform the following steps to create a notebook in Databricks, configure the notebook to read data from an Azure Blob storage account, and then run a Spark SQL job on the data.

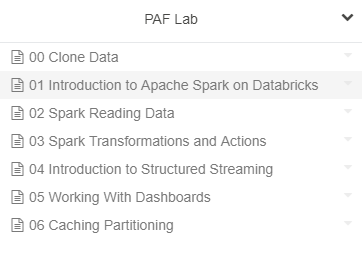
1. In the left pane, click Workspace. From the Workspace drop-down, click Users, select your username, and then click on the drop down arrow next to your name, and select ‘Import’..



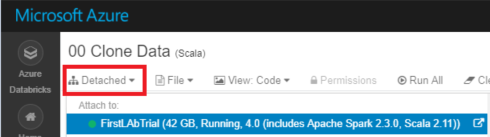
1. In the Import Notebooks window, select ‘browse’.



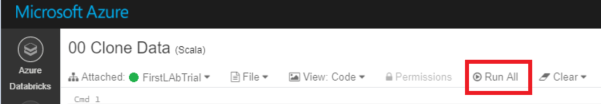
1. In the browse window, navigate to the directory you exported the Workshop Documents and select the DatabricksCustomVisionLab.dbc archive file.
2. Back on the Import Notebooks window, click on ‘Import’.
3. Once imported, you should be able to see the following notebooks:



1. Click on the ’00 Clone Data’ notebook to open it.
2. To attach the notebook to a cluster, select the ‘Detached’ icon on the top bar.

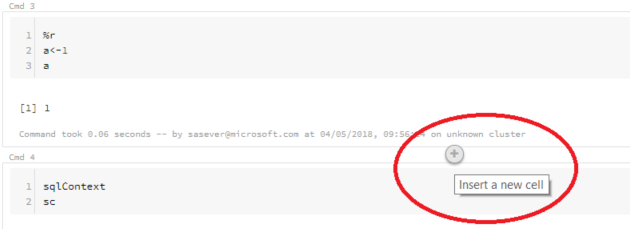


1. Select the cluster created in the earlier steps, in the ‘Attach to’ options.
2. Click on ‘Run all’ option from the top bar:



1. This notebook, prepares data for exercises further. Please look into the notebook to understand the copy syntax. This is optional, as you can connect to multiple data sources, in a similar way.
2. Once this notebook executes successfully, go back to the imported ‘PAF Lab’ folder and open the ’01 Introduction to Apache Spark on Databricks’ Notebook.

* All the exercises and steps are now part of the notebook itself.
* Although when there is a question the answers are usually given within the notebook, try to write them by yourself first.
* To try that you can always add a new code block by clicking insert new cell, which appears when your cursor comes between cells.



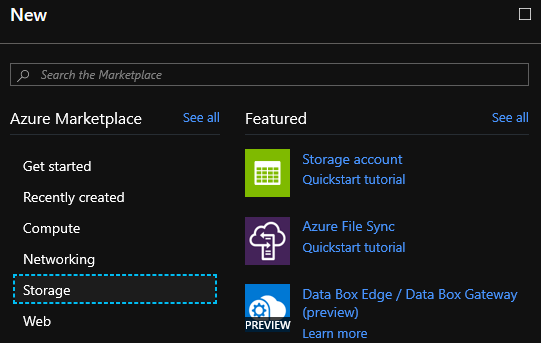
* You can execute cell by cell by using ‘Shift + Enter’ after selecting the cell in the notebook.
* Keep following the instructions in the notebook to proceed with the exercise

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| Mounting Blob Storage |

**Create and Link Blob Storage**

Perform the following steps to create a Storage Account and mount it to Databricks.

1. Create a new Storage Account.



1. After deployment, create a blob storage container and put your test images there.
2. Follow AzureBlobMount notebook in Databricks.

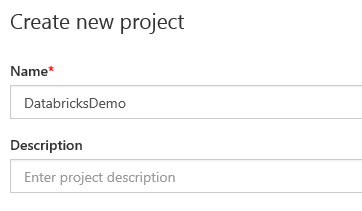
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| Custom Vision |

**Using Custom Vision portal**

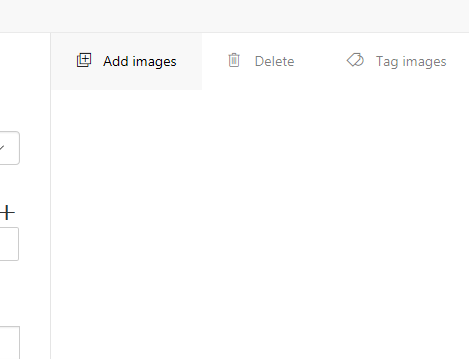
Perform the following steps to create a Custom Vision service.

1. Go to customvision.ai

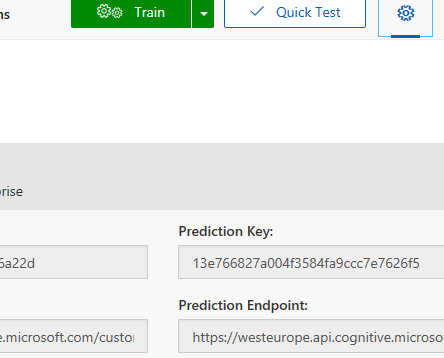
2. Create Custom Vision Project in customvision.ai



1. Add and tag images



1. Train the model and get the base url,prediction key, project id, publish iteration name from the settings page.



1. Go to databricks UseCustomVisionModel notebook and follow it.

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