



The Advanced Analytics Laboratory

17 – 18 February 2016
Microsoft Offices, Bryanston
Auditorium 3



Summary

The Advanced Analytics Laboratory is a 2-day training course that explores the following topics through a series of hands-on labs and 'chalk & talks':

- Azure Machine Learning
- Revolution R Open
- Azure Stream Analytics
- Azure Data Factory
- Azure Data Warehouse
- HDInsight
- Power BI Dashboards

During the course you will also learn how these components can be combined to operationalize analytical workloads.

Please note: This is a hands-on training course. PowerPoint presentations are kept to a minimum (1½ hours over two days).

Audience

Given the technical nature of this training course the target audience are data scientists, analytics application developers and analysts.

Prerequisites

An Azure subscription with admin rights (during the course participants will be creating VMs, which will be shutdown/deleted at the end of each lab). Participants should use their organisation's Azure enterprise agreement or have signed up to the one-month free trial ([click here](#)). This will allow you to 'take away' the training and further develop your skills upon completion of the training course.

Cost

The training is provided free of charge. However, **participants are expected to meet the costs of their own travel and expenses.**

Location

Microsoft Offices, Conference Room 3,

3012 William Nicol Drive, Bryanston

Start/Finish Times

Day 1: 09:30 – 17:30

Day 2: 09:00 – 16:45

Catering

Tea, coffees and lunch will be provided each day.

Dress code

Casual

Day 1 – Agenda

Time	Session	Detail
09:30-09:45	Coffee, introductions and getting logged on	
09:45-11:00	Presentation: The Cortana Analytics Suite	In this presentation, we overview how predictive analytics can be operationalized using the Cortana Analytics Suite.
11:00-12:00	Lab: Introduction to Machine Learning	<p>This lab is intended to serve as an introduction to creating a predictive model with Azure Machine Learning. Upon completing this lab, you will have hands-on experience with the following functions and concepts related to Azure Machine Learning:</p> <ul style="list-style-type: none"> • Creating and logging in to a free Azure Machine Learning Workspace • Creating, modifying, and saving an experiment with ML Studio • Exploring summary statistics about datasets and features • Splitting data into a training dataset and a test dataset • Training a Linear Regression model • Testing a trained model • Evaluating model performance
12:00-13:00	Lunch	
13:00-14:00	Lab: Deploying a predictive model with Azure Machine Learning	<p>This lab explores unsupervised learning in Azure Machine Learning and how to deploy a predictive model as a web service. Upon completing this lab, you will have hands-on experience with the following functions and concepts related to Azure Machine Learning:</p> <ul style="list-style-type: none"> • Copying an experiment from the Azure Machine Learning Gallery to the ML Studio • Creating a Scoring Experiment • Deploying a model as a web service • Modifying Web service inputs and outputs • Testing the web service via the web UI
14:00-15:00	Lab: Text Analytics with R and Azure Machine Learning	<p>This lab explores text analytics and R integration with Azure Machine Learning. Upon completing this lab, you will have hands-on experience with the following functions and concepts related to Azure Machine Learning and R:</p> <ul style="list-style-type: none"> • Reading data from Azure Blob Storage into an experiment in ML Studio • Executing R Scripts in ML Studio • Connecting input data to R Scripts in ML Studio • Visualizing outputs from an R Script in ML Studio • Performing common text analytics tasks in R • Preparing/Cleaning unstructured text data • Aggregating/extracting terms from unstructured data • Visualizing term frequency with a Word Cloud
15:00-15:15	Break	
15:15-16:30	Free Lab: Azure Machine Learning	<p>In this lab you can choose a “recipe” to further explore Azure Machine Learning. However, the recipes are light on detail to aid your exploration. You can choose from the following recipes:</p> <ul style="list-style-type: none"> • Any Data! • Restaurant Recommendation Engine • Twitter Sentiment modelling
16:30-17:30	Lab: Operationalizing R with Azure Machine Learning	<p>In this lab we will explore the functionality of the AzureML R package. Upon completing this lab, you will have hands-on experience with the following functions and concepts related to operationalizing R with Azure Machine Learning:</p> <ul style="list-style-type: none"> • Workspace: connect to and manage AzureML workspaces • Datasets: upload and download datasets to and from AzureML workspaces • Publish: define a custom function or train a model and publish it as an Azure Web Service • Consume: use available web services from R in a variety of convenient formats

Day 2 – Agenda

Time	Session	Detail
09:00-09:30	Chalk & Talk: Q&A and Best practices	During breakfast we will have a 'chalk & talk' session on the best practices for getting the optimal results from the Cortana Analytics Suite
09:30-09:45	Presentation: Introduction to Azure Stream Analytics	In this quick presentation we will highlight how Stream Analytics integrates with the Cortana stack.
09:45-10:45	Lab: Introduction to Azure Stream Analytics	<p>In this lab we explore the real-time analytics capability of Azure Stream Analytics. Upon completing this lab, you will have hands-on experience with the following functions and concepts related to stream analytics:</p> <ul style="list-style-type: none"> • Generate Event Hub sample data • Prepare an Azure SQL Database for storing output data • Create a Stream Analytics job • Starting and Changing the job query
10:45-11:00	Break	
11:00-11:15	Chalk & Talk: Azure Stream Analytics vs Apache Storm	In this 'chalk & talk' we discuss the key differences between Azure Stream Analytics vs Apache Storm and Azure Event Hubs vs Apache Kafka.
11:15-12:30	Lab: Enabling a Real-Time Microsoft Power BI Dashboard with Azure Stream Analytics	<p>In this lab you will produce a real-time PowerBI dashboard by using Azure Service Bus and Azure Stream Analytics. Upon completing this lab, you will have hands-on experience with the following functions and concepts related to Stream Analytics and Power BI:</p> <ul style="list-style-type: none"> • Sign in to Power BI • Create an Azure Service Bus event hub • Create an Azure Stream Analytics (ASA) job to output the temporal aggregation of events • Configure a real-time dashboard based on an ASA job output
12:30-13:30	Lunch	
13:30-14:30	Presentation: Introduction to Azure Data Warehouse and Demo for Azure Machine Learning using Azure Data Warehouse	<p>In this presentation we will give an overview of what is Azure Data Warehouse and including a demo for incorporating Azure Machine Learning with Azure Data Warehouse. The concepts on Azure Data Warehouse that will be covered:</p> <ul style="list-style-type: none"> • Azure Data Warehouse Architecture • Massive Parallel Processing • Distributed Query Theory • Denormalised Data Structures
14:30-14:45	Break	
14:45-15:00	Presentation: Introduction to Azure Data Factory	In this presentation we will give an overview of what is Azure Data Factory and how it can be used to orchestrate predictive analytic workflows.
15:00-16:30	Lab: Create Predictive Pipelines using Azure Data Factory and Azure Machine Learning Web-Services	<p>This lab explores building a predictive analytics pipeline, and deploying it to the Azure Data Factory. Upon completing this lab, you will have hands-on experience:</p> <ul style="list-style-type: none"> • Creating a data factory • Creating a Scoring Experiment in Azure Machine Learning • Deploying a model as a web service in Azure Machine Learning • Creating the following linked services: <ul style="list-style-type: none"> ○ Azure Storage Account – The Azure storage account will be used to store files used by the on-demand HDInsight cluster. ○ On-Demand HDInsight Cluster – A HDInsight cluster will be started on-demand to transform and analyze the data using HQL (Hive). ○ Azure Machine Learning - The transformed dataset will be sent to the Azure Machine Learning web service (created earlier) to be scored against the pre-trained model. • Creating output datasets in an Azure SQL database • Using Power BI to display the outputs of the predictive model
16:30-16:45	Wrap-up	In this session we will wrap-up the lab with a quick Q&A