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Creating Solutions with the Team Data Science Process (TDSP)

In this hands-on workshop, you’ll cover a series of modules that guide you in understanding how to implement an analytics solution using the Team Data Science Process. You’ll learn how to work through a real-world scenario using Microsoft Azure Machine Learning Services along with other Microsoft technologies. You'll learn how to modify the solution we create in the class solution for implementations in your own scenarios.

This course is designed to take approximately one day.

Getting Started

You’ll need a laptop that you can install software on, a Microsoft Azure account, experience with Machine Learning and Programming in Python, along with several other pre-requisites. See the “README.md” file in the “Students” folder on the github location for this course for a full list prior to taking this course.

If these pre-requisites are new to you, there is a complete Learning Path in the “Instructions” folder called “Learning Path - Creating Solutions with the Team Data Science Process.md” that you can use to learn these technologies and processes. You should be able to complete all tasks in that Learning Path prior to attending this course.

Course Modules

1 – Introduction to the Team Data Science Process (TDSP)

In module one, we’ll cover an overview of the TDSP, with an explanation of each phase. You’ll also set up your environment for the rest of the course. By the end of the module, students should be familiar with the Team Data Science Process, the Microsoft Business Analytics and AI Platform and Azure DevOps for Data Science.

NOTE: Much of the setup must be accomplished prior to class. See the “README.md” file in the “Students” folder for these requirements.

2 – Business Understanding

At the end of this module, students should be able to determine questions from business requirements, locate and document data sources for Advanced Analytics, and use patterns to create solution frameworks.

During the module, a business case is presented, and the instructor takes the students through the process of breaking a statement down into key words used to determine the question to be answered with data storage technologies and data processing technologies, ultimately using a decision matrix to create a solution workflow.

3 - Data Acquisition and Understanding

Upon completion of this module, students should have hands-on experience and understanding of how to ingest data into the solution, explore data using the Azure Machine Learning Services (AMLS) Workbench tool, and create a mechanism to orchestrate and manage data flows through a solution.

4 – Modeling

This module is focused on Machine Learning. In this module, students will learn about Machine Learning options and create a Machine Learning solution in their AMLS environment. Students will be able to create, save, and run Machine Learning models using the AMLS Workbench tool.

5 – Deployment

This module covers the deployment of an AMLS model. Students will learn to track and monitor models and their runs using the AMLS Workbench tool. The students will learn how to deploy the results of the model to be used in client and downstream applications.

6 - Customer Acceptance

In this module, several important post-deployment activities are discussed in detail including: customer handoff and acceptance, altering and maintaining a solution, and monitoring and reporting on the solution.

Build and Test

This project contains three folders in the github folder:

Instructions

Materials needed to teach or prepare for this course are stored here.

Instructor

All source training materials, PowerPoint files, and other teaching resources are located here.

Students

Pre-Requisites, Student Workbooks, Resource files, Data Sources and other student assets are located here.

Contribute

You may fork or download this course for your own use. Please notify the training team of any errors or omissions using the “issues” feature on the course’s github location.

*NOTE: These workbooks contain many resources to lead you through the course, and provide a rich set of references that you can use to learn much more about these topics. If the links do not resolve properly, type the link address in manually in your web browser. If the links have changed or been removed, simply enter the title of the link in a web search engine to find the new location or a corollary reference.*

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At the end of this Module, you will:

* Alter your solution
* Work with your customer to use the solution
* Hand over the solution to the customer

We’ll be using this scenario to build out our solution - https://gallery.cortanaintelligence.com/project/69a191fde3af424b9e21ba720003bd9f

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* This process largely follows the CRISP-DM model - http://www.sv-europe.com/crisp-dm-methodology/

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* It also references the Microsoft Business Analytics and AI process - https://azure.microsoft.com/en-us/documentation/articles/data-science-process-overview/
* A complete process diagram is here - https://azure.microsoft.com/en-us/documentation/learning-paths/data-science-process/
* Some walk-throughs of the various services - https://azure.microsoft.com/en-us/documentation/articles/data-science-process-walkthroughs/
* An integrated process and toolset allows for a more close-to-intent deployment
* Iterations are required to close in on the solution – but are harder to manage and monitor

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* Azure Data Catalog - http://azure.microsoft.com/en-us/services/data-catalog **(Doc It)**
* Azure Data Factory - http://azure.microsoft.com/en-us/services/data-factory/ **(Move It)**
* Azure Event Hubs - http://azure.microsoft.com/en-us/services/event-hubs/ **(Bring It)**
* Platform and Storage - Microsoft Azure – https://azure.microsoft.com/ Storage - https://docs.microsoft.com/en-us/azure/storage/ **(Host It)**
* Azure Data Lake - https://azure.microsoft.com/en-us/solutions/data-lake/ **(Store It)**
* Azure SQL Data Warehouse - http://azure.microsoft.com/en-us/services/sql-data-warehouse/ **(Relate It)**
* Azure Cosmos DB - https://docs.microsoft.com/en-us/azure/cosmos-db/introduction
* Cortana - http://blogs.windows.com/buildingapps/2014/09/23/cortana-integration-and-speech-recognition-new-code-samples/ and https://blogs.windows.com/buildingapps/2015/08/25/using-cortana-to-interact-with-your-customers-10-by-10/ and https://developer.microsoft.com/en-us/Cortana **(Say It)**
* Cognitive Services - https://www.microsoft.com/cognitive-services
* Bot Framework - https://dev.botframework.com/
* Azure Machine Learning - https://docs.microsoft.com/en-us/azure/machine-learning/preview/ **(Learn It)**
* Azure HDInsight - http://azure.microsoft.com/en-us/services/hdinsight/ **(Scale It)**
* Azure Stream Analytics - http://azure.microsoft.com/en-us/services/stream-analytics/ **(Stream It)**
* Analysis Services - https://docs.microsoft.com/en-us/azure/analysis-services/analysis-services-overview
* Power BI - https://powerbi.microsoft.com/ **(See It)**
* All of the components within the suite - https://www.microsoft.com/en-us/cloud-platform/what-is-cortana-intelligence
* Templates - https://gallery.cortanaintelligence.com/browse?orderby=freshness%20desc&skip=0&categories=%5B%2210%22%5D and https://caqs.azure.net/#gallery

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* The Customer Acceptance Phase - https://docs.microsoft.com/en-us/azure/machine-learning/team-data-science-process/lifecycle-acceptance

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* Creating custom solutions: https://start.cortanaintelligence.com/CustomSolutions

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* Overview - https://docs.microsoft.com/en-us/azure/application-insights/app-insights-overview
* Application Insights for Python - https://github.com/Microsoft/ApplicationInsights-Python

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* Project Post-Mortem document: https://github.com/Azure/Azure-TDSP-ProjectTemplate/blob/master/Docs/Project/Exit%20Report.md

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* Review this section on Model Data Collection - https://docs.microsoft.com/en-us/azure/machine-learning/preview/how-to-use-model-data-collection
* Review this section on Troubleshooting - https://docs.microsoft.com/en-us/azure/machine-learning/preview/how-to-deploy-troubleshooting-guide
* Read this page - https://docs.microsoft.com/en-us/azure/application-insights/app-insights-overview
* Review this video with the instructor - https://applicationanalytics-media.azureedge.net/home\_page\_video.mp4

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