WORLD EDUCATION ALLIANCE

POWER BI BOOTCAMP

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Course Duration: 4 Days

About this course

Power BI Bootcamp is fast-paced 4-day training course designed to teach students how to build and deploy custom solutions using Power BI and Microsoft's rapidly evolving Business Application Platform. The course provides in-depth, hands-on lab exercises that reinforce the skills required to use Power BI Desktop and a project-based approach to create custom solutions with insightful data analytics and powerful visualizations.

This course includes coverage of the query and data modeling tools in Power BI Desktop and students will learn how to write advanced DAX expressions to calculate rankings, rolling averages and year-to-year comparisons. Students will also learn how to design interactive reports and mobile-friendly dashboards. The course discusses the essential differences between working with imported datasets versus working with DirectQuery-mode datasets. The course teaches students how to configure row-level security (RLS) and how and why you might need to install an on-premises gateway.

This course examines Power BI apps and demonstrates how to leverage the new Power BI app model to deploy and update custom Power BI solutions in a production Office 365 environment. Along the way, students will also learn how to extend Power BI using other Business Application Platform technologies and services including R data analytics, Microsoft Flow and PowerApps.

Student Prerequisites

Students should be familiar with Microsoft Excel, Office 365 and Power BI environment. It is recommended that students have experience working with databases, Power BI Desktop and other related BI technologies.

Day 1	Day 2	Day 3	Day 4
Introducing the Power BI Platform	Writing Advanced DAX Expressions	Understanding Data Refresh and DirectQuery Mode	Getting Started with R in Power BI Desktop
Designing Queries to Extract and Transform Data	Designing and Publishing Interactive Reports	Designing and Sharing Dashboards	Integrating Microsoft Flow into a Power BI Solution
Creating a Rich Data Model using DAX	Configuring Row Level Security	Creating Power BI Apps to Deploy Reports and Dashboards	Extending a Power BI Solution using PowerApps

Module 01: Introducing the Power BI Platform

This module introduces the fundamental concepts and terms associated with the Power BI platform. Students will learn about Power BI architecture and gain a solid understanding of how Power BI and the Business Application Platform have been integrated with Microsoft Azure, Azure Active Directory and Office 365. Students will work through the steps required to create a trial Office 365 tenant which can serve as a multiuser test environment for designing and testing custom Power BI solutions. Students will learn how to get up and running in the Power BI Service by creating datasets, reports and dashboards using the browser. The module teaches students about Power BI licensing as well as the key differences between standard Power BI subscriptions and a Power BI Pro subscriptions. The module concludes by discussing how to keep current with the Power BI cloud cadence and the monthly updates that Microsoft consistently applies to the Power BI platform.

Topics Covered

- Understanding Power BI Architecture

- Building Solutions on Microsoft's Business Application Platform

- Creating a Trial Office 365 Tenant for Development

- Creating Datasets, Reports and Dashboards

- Understanding Power BI Licensing

- Staying in Sync with Monthly Updates

Module 02: Designing Queries to Extract and Transform Data

This module examines the query tools in Power BI Desktop. Students will learn to import data from a variety of sources including Excel workbooks, databases, web pages and SharePoint lists as well as how to create a data model that mashes up data from multiple data sources. Students will also learn effective techniques for cleansing data during the import process and for converting text-based columns into numeric types. The module discusses the best practice of designing queries to generate a star schema composed of fact tables and dimension tables as well as how to take advantage of advanced query features such as working directly with M code and creating query parameters, query functions and Power BI template files.

Topics Covered

- Understanding Query Design and the ETL Process

- Working in the Query Editor Window

- Cleansing and Reshaping Data

- Designing Queries to Generate a Star Schema

- Designing Projects with Query Parameters and Query Functions

- Creating Reusable Project Template Files

Module 03: Creating a Rich Data Model using DAX

This module provides an in-depth examination of the tabular database model and the data modeling features available in Power BI Desktop. Students will also learn the technical details of creating table relationships as well as the best practices for writing maintainable DAX code for calculated columns and measures. The module demonstrates how to create a dynamic lookup table using DAX and integrate it into a data model to assist with data categorization. Students will learn how extend tables with dimension hierarchies and with geographical column metadata to facilitate mapping data to countries, states, cities and zipcodes.

Topics Covered

- Understanding the Tabular Database Model

- Creating Calculated Columns and Measures

- Writing DAX Expressions using Best Practices

- Creating Dynamic Lookup Tables using DAX

- Extending a Data Model with Dimensional Hierarchies

- Configuring Columns with Geographic Metadata

Module 04: Writing Advanced DAX Expressions

This module begins with an in-depth examination of the DAX evaluation context and how it affects the way you write advanced expressions for measure. Students will learn to use the CALCULATE function to write DAX expressions that either fully or partially ignore the current filter context. The module discusses extending a data model with a calendar tables and using the Time Intelligence functions in DAX to analyze and report on data in a variety of time dimensions. Along the way, students will learn how to write measures using DAX for common scenarios such as product rankings, rolling averages and year-to-year comparisons.

Topics Covered

- Understanding the Evaluation Context

- Writing DAX Expressions with the CALCULATE Function

- Extending a Data Model with a Calendar Table

- Writing Expressions using DAX Time Intelligence Functions

- Writing DAX Code That's Contextually Aware

Module 05: Designing and Publishing Interactive Reports

This module examines the report designer features in Power BI Desktop and teaches students how to create interactive reports using the standard set of Power BI visuals together with slicers, visual highlighting and drill actions. Students will learn how to find and import custom visuals into a Power BI Desktop project. The module teaches students how to use Phone Layout view to create mobile reports as well as how to use report themes to style and brand reports. Students will learn to publish Power BI reports to the Power BI service. Students will also learn how to use the Publish to SharePoint feature to publish reports to SharePoint Online and the Publish to Web feature to publish reports on the Internet with anonymous access.

Topics Covered

- Designing Interactive Reports

- Importing Custom Visuals

- Designing Mobile Reports using Phone Layout View

- Styling and Branding Report using Report Themes

- Publishing a PBIX Project File to the Power BI Service

- Publishing Reports to SharePoint Online and to the Web

Module 06: Understanding Data Refresh and DirectQuery Mode

The module begins by examining the differences between imported datasets and DirectQuery-mode datasets. Students will learn how to configure data source credentials in the Power BI service as well as how to refresh imported datasets on demand or in a scheduled fashion. The module also discusses managing Power BI service connectivity to on-premises data sources and determining which scenarios require you to install and configure an On-Premises Gateway. The module also explains high-level design issues and the important restrictions you face when creating a Power BI Desktop project using DirectQuery mode to establish a live connection with a relational database. The module concludes with a look at how to create and design a project which establishes a live connection to a tabular database running in SQL Server Analysis Services (SSAS).

Topics Covered

- Comparing Imported Datasets to DirectQuery-mode Datasets

- Configuring Credentials and Refreshing Imported Datasets

- Understanding When and How to Install an On-premises Gateway

- Using DirectQuery Mode to Connect to a Relational Database

- Using DirectQuery Mode to Connect to an SSAS Tabular Database

Module 07: Configuring Power BI Datasets with Row-level Security (RLS)

The module introduces the fundamental concepts and terms of the row-level security model supported for Power BI datasets. Students will learn how to create and test security roles in a Power BI Desktop project and how to write table filter expressions which restrict the data that is viewable by members of a specific role. The module explains the technical issues involved when configuring RLS on a DirectQuery-mode dataset and explains why it's necessary to configure

cross filtering in both directions. After publishing a Power BI Desktop project with security roles, students will learn how to configure security roles by assigning Office 365 groups and users as members. The module concludes with a discussion of designing a dynamic security scheme based on using the USERNAME function in DAX together with a custom table that associates users with the data they are allows to access.

Topics Covered

- Understanding Row-level Security Fundamentals
- Creating Roles in Power BI Desktop
- Writing Table Filter Expressions using DAX
- Configuring Bidirectional Cross Filtering for DirectQuery Mode
- Configuring and Testing RLS in the Power BI Service
- Writing DAX expressions using the USERNAME Function

Module 08: Designing Dashboards in Power BI

The module teaches students the fundamentals of creating dashboard and discusses the strengths and limitations of dashboards when compared to Power BI reports. Students will learn how to integrate dashboards with Natural Language Q&A and how to pin Q&A query results to create dashboard tiles. The module demonstrates using Phone Layout view to design dashboards that look quite dashing on mobile devices such as iPhones and Androids. Student will learn how to configure data alerts on dashboard tiles as well as how to leverage dashboard sharing as a simple mechanism to share dashboards and reports with other users. The module concludes with a discussion of creating streaming datasets in Power BI and building custom solutions with real-time dashboards.

Topics Covered

- Understanding the Differences between Dashboards and Reports
- Designing Dashboards for Mobile Devices
- Integrating Dashboards with Natural Language Q&A
- Configuring Data Alerts on Dashboard Tiles
- Sharing Dashboards with Other Office 365 Users
- Power BI Support for Real-time Dashboards

Module 09: Creating Power BI Apps to Deploy Reports and Dashboards

The original strategy for deploying reports and dashboards in Power BI was designed in terms of group workspaces and organization content packs. In May of 2017, Microsoft introduced a new ALM strategy based on Power BI Apps and App workspaces to provide a richer and less complicated approach for deploying and updating custom solutions. This module examines the evolving feature set of the new Power BI App model and walks through the steps required to create and publish a Power BI app to facilitate deploying a set of reports and dashboards from a development workspace to a wider audience in a safe and secure manner. Students will also learn how to configure an app to remap a dataset from a development database over to the production database. The module also examines the process of updating a Power BI app after it's been published using staged updates.

Topics Covered

- Looking Back at Group Workspaces Organizational Content Packs

- Introducing Power BI Apps and App Workspaces

- Creating an App with Dashboards, Reports and Datasets

- Managing App Lifecyle in an Office 365 Tenant

- Remapping Datasets to a Production Database

- Updating an App After It's Been Published

Module 10: Getting Started with R in Power BI Desktop

This module provides a fast and furious introduction to R as the world's most popular platform for advanced data analytics and data visualization. Students will learn how to get up and running with the R platform by installing the Microsoft Open R Client and a trial version of RStudio. The module teaches students R language syntax fundamentals and explains how to import and consume popular R packages. Students will begin their lives as an R coder by writing and testing simple R scripts using RStudio. After that, the module demonstrates how to take advantage of the R integration with Power BI Desktop which makes it possible to create and execute R scripts to import and transform data and to generate charts using R visualization packages such as lattice and ggplot2.

Topics Covered

- Understanding R as a Data Analytics Platform

- Installing the Required Software for R Development

- Writing and Executing R Scripts using RStudio

- Writing R Scripts to Import Data into Power BI Desktop

- Writing R Scripts to Create Advanced Visuals in Power BI Desktop

Module 11: Integrating Microsoft Flow into a Power BI Solution

This module provides a quick primer on Microsoft Flow and explains how to get started creating flows in Microsoft's Flow Designer. Students will learn how to integrate Flow with Power BI to create a streaming dataset and a real-time dashboard. The module examines design a flow that periodically runs searches against Twitter for specific keywords and hashtags and uses the search results to populate a streaming dataset in a Power BI workspace. Students will also learn how to create flows triggered by Power BI data alerts which are designed to send out push notifications and create SharePoint items such as tasks and calendar events.

Topics Covered

- Understanding Microsoft Flow Fundamentals

- Creating Flows using Triggers, Actions and Conditions

- Creating a Flow to Populate a Streaming Dataset

- Using a Streaming Dataset to Create a Real-time Dashboard

- Creating a Flow Triggered by a Power BI Data Alert

Module 12: Extending a Power BI Solution using PowerApps

This module provides an overview of PowerApps as a platform for building mobile-friendly apps. Students will learn how to get up and running with PowerApps Studio to create and test screens and custom forms. The module also teaches students how to integrate PowerApps with Flow and to work with the different types of supported datasources and connectors. Students will learn how to use PowerApps to create mobile-friendly apps to view and update content in SharePoint lists.

Topics Covered

- Getting Started with PowerApps Studio

- Using PowerApps to Create Screens and Custom Forms

- Configuring Data Sources and Connectors

- Using PowerApps to Create Mobile-friendly Apps to Update SharePoint Lists

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