PL-300 | Instructor Demos

Contents

0: Demo setup

VM setup

1. Sign in to the virtual machine environment using the **Student** account.

2. Open Microsoft Edge, then navigate to **https://powerbi.com** and sign in using the instructor account.

    Tip: If prompted to change the password, be sure to record it in the **D:\PL300\Demo\Setup\MySettings.txt** *file.*

3. In the Power BI service, accept the Power BI Pro trial.

First demo setup

4. Create a workspace and use the **D:\PL300\Demo\Resources\Icon-Star.jpg** image as its icon.

5. Open the **D:\PL300\Demo\Setup\Sales Analysis.pbix** file in Power BI Desktop.

6. In Power BI Desktop, sign in by using the instructor account.

7. Publish the report to the workspace you created earlier.

8. In the Power BI service, open the **Sales Analysis** report, and then pin the column/line chart visual to create a new dashboard named **Sales Monitoring**.

9. Pin the funnel chart to the dashboard, also.

10. Open the dashboard and leave it ready for the first demo.

11. Close Power BI Desktop.

Demo assets can be found in the [PL-300 Power BI Data Analyst GitHub Repository](#).

1: Get Started with Microsoft Data Analytics

Explore the dashboard

1. Show the **Sales Monitoring** dashboard, and explain how it can be used to get at-a-glance facts.

2. Click either tile to click through to the **Sales Analysis** report.

Explore the report

3. Interact with various slicers and visuals across the pages.

4. Edit the report, and then expand all fields in the **Fields** pane.

Describe the solution that will be developed during the course

5. Explain that the data model is based on a SQL Server database and an Excel workbook, which helps to determine cost of goods sold.

6. Explain that a gateway will be set up to keep data current.

7. Explain that it will be shared with a recipient, and that recipients will only be allowed to see a subset of data being only the product categories they manage.

8. Return to the Power BI service home page, and collapse the workspace.

   You will not use this pre-developed solution again.

2: Prepare Data in Power BI

Start the development of a Power BI report

1. Open Power BI Desktop, and then dismiss the getting started page.

2. Save the file to the **D:\PL300\Demo** folder as **Sales Analysis**.

Connect to a SQL Server database

3. "Get data" from SQL Server.

4. Connect to the database server name found in the **MySettings.txt** file, using Windows authentication.

5. Expand the **TailspinToys2020-US** database.

Create queries based on database tables

6. Select the **Product** table to preview the data.

7. Check the **Product** table to create query.

8. Repeat the **Sales** table.

9. Click **Transform Data**.

Preview data

10. Describe the Power Query Editor window layout, including the **Queries** pane, the **Query Settings** pane, the ribbon, the preview grid, and the status bar.

11. Point out the quality bar beneath the column headers and hover the cursor over it to reveal statistics about the column values.

12. On the **View** ribbon tab, turn on **Column Quality**.

13. Turn on **Column Distribution** and point out columns like **ProductID** (unique values) and **ProductCategory** (several duplicate values).

14. Turn on **Column Profile**, and then select the **ProductCategory** column.

15. Point out the column statistics and distribution.

16. Turn back off the three options.

17. Save the Power BI Desktop file, but do not apply changes.

18. Leave the Power BI Desktop file open for the next demo.

3: Clean, Transform, and Load Data in Power BI

Apply query transformations

1. First, apply transformations to the **Product** query.

2. Remove the **RetailPrice**, **Photo**, and **Sales** columns.

3. Change the data type of the **Channels** column to **Whole Number**.

4. Rename the following columns:

   - **ProductSKU** to **SKU**

   - **ProductName** to **Product**

   - **ProductCategory** to **Category**

   - **ItemGroup** to **Item Group**

   - **KitType** to **Kit Type**

5. Second, apply transformations to the **Sales** query.

6. Remove all columns, except:

   - OrderDate

   - ProductID

   - Quantity

   - UnitPrice

7. Change the data type of the **UnitPrice** column to **Fixed Decimal Number**.

8. Rename the **UnitPrice** column to **Unit Price**.

9. Multi-select the **Quantity** and **Unit Price** columns, and then add a new column based on their multiplication.

10. Rename the new column as **Sales**.

Integrate queries

11. Create a new query using the Excel connector, connecting to the **D:\PL300\Demo\Data\ProductCost.xlsx** file.

12. Remove the **Product** column.

13. Change the data type of the **ProductCost** column to **Fixed Decimal Number**.

14. Select the **Product** query, and then merge with the **ProductCost** query, relating the **SKU** columns.

15. In the **Privacy Levels** window, set the privacy level for the **D:** to **Organizational**.

16. Expand the **ProductCost** column to include the **ProductCost** column (from the **ProductCost** query).

17. Rename the new column as **Cost**.

Disable a query

18. In the **Queries** pane, disable the **ProductCost** query.

Load queries to the data model

19. On the **Home** ribbon tab, click the **Close & Apply** icon.

20. In Power BI Desktop, point out the two tables in the **Fields** pane.

21. Save the Power BI Desktop file.

22. Leave the Power BI Desktop file open for the next demo.

4: Design a Data Model in Power BI

Review the model

1. In the **Fields** pane, expand all tables to reveal all fields.

2. In the **Sales** table, point out the **OrderDate** hierarchy, which was created automatically.

    Explain that a Date table will be created in the next demo.

3. In Model view, hover over the automatically-created relationship between the two tables.

4. Explain how filters will propagate from the **Product** table to the **Sales** table.

Create a hierarchy

5. Create a hierarchy based on the **Product** table **Category** column.

6. Rename the hierarchy as **Products**.

7. Add the **Product** column as the second level.

Set model properties

8. Hide both the **ProductID** columns.

9. Format the **Quantity** column to use the thousands separator.

10. Multi-select the **Sales** and **Unit Price** columns, and format them to use two decimal places.

Validate the model design with a matrix visual

11. In Report view, add a matrix visual to the page, and then size it to fill the entire page.

12. Add the **Products** hierarchy to the rows, and then add the **Quantity**, **Sales**, and **Unit Price** fields.

13. Expand all levels of the **Products** hierarchy.

14. Point out that the **Unit Price** values are the sum of prices, which is not correct.

15. In the **Fields** pane, select the **Unit Price** field, and configure its summarization to use **Average**.

16. Remove the **Sum of Unit Price** column from the matrix visual, and then add the **Unit Price** field back again.

17. Save the Power BI Desktop file.

18. Leave the Power BI Desktop file open for the next demo.

5: Create Measures using DAX in Power BI

Create a calculated table

1. Create a calculated table by using the following expression:

   DAX

   Date = CALENDARAUTO()

   *All calculations can be copied from the **D:\PL300\Demo\Resources\Snippets-Demo-05.txt** file.*

2. Switch to Data view, and review the table, which comprises a single date column.

Create calculated columns

3. Add a calculated column to the **Date** table:

   DAX

   Year = "CY" & YEAR('Date'[Date])

4. Add an additional calculated column to the **Date** table:

   DAX

   Month = FORMAT('Date'[Date], "YYYY-MM")

5. In Model view, create a relationship by dragging the **Date** table **Date** column to the **Sales** table **OrderDate** column.

6. Hide the **Sales** table **OrderDate** column.

7. In the **Date** table, create the **Calendar** hierarchy, with **Year** and **Month** levels.

8. In Report view, mark the **Date** table as a date table using the **Date** column.

9. In the matrix visual, remove the **Products** hierarchy, and then replace it with the **Calendar** hierarchy.

10. Add a calculated column to the **Sales** table:

    DAX

    Cost = 'Sales'[Quantity] * RELATED('Product'[Cost])

11. Format the **Cost** column to two decimal places.

Create a Quick Measure

12. Add a quick measure to the **Sales** table, subtracting the **Cost** column from **Profit** column.

13. Rename the measure as **Profit**.

14. Explain that the measure does not store data in the model.

Create regular measures

15. Add a measure to the **Sales** table:

    DAX

    Profit Margin = DIVIDE([Profit], SUM('Sales'[Sales]))

16. Format the **Profit Margin** column as a percentage.

17. Add another measure to the **Sales** table:

    DAX

    Sales YTD = TOTALYTD(SUM('Sales'[Sales]), 'Date'[Date])

18. Format the **Sales YTD** column to two decimal places.

Validate the calculations with the matrix visual

19. Add the **Cost**, **Profit**, **Profit Margin**, and **Sales YTD** fields to the matrix visual.

20. Save the Power BI Desktop file.

21. Leave the Power BI Desktop file open for a later demo.

6: Optimize Model Performance

Review a DirectQuery model design

Note: This demo uses a different Power BI Desktop file.

1. Open the **D:\PL300\Demo\Resources\AW Sales Analysis.pbix** file.

2. If prompted to connect to the data source, click **Connect**.

3. At the bottom-right corner, point out that the data model comprises DirectQuery tables.

4. Save the Power BI Desktop file to the **D:\PL300\Demo\MySolution** folder.

5. In Model view, introduce the model design, which includes two related tables.

6. In Report view, interact with the report by selecting different items in the **Fiscal Year** slicer.

7. Drill through on any month column to reveal order details.

8. Return to the **Sales Summary** page.

Review query performance

9. On the **View** ribbon tab, show the **Performance Analyzer** pane.

10. Refresh the visuals, and then expand the slicer and **Sales by Month** visual and point out that they used DirectQuery mode (data was requested from the data source).

Configure Dual storage tables

11. In Model view, select the **Date** table, and then select the storage mode to **Dual**.

12. When the data has imported, switch to Report view, and then in the **Performance Analyzer** pane, refresh the visuals.

13. Point out that the **Date** table is now queried from the model cache.

Create aggregations

14. Open the Power Query Editor window, and in the **Queries** pane, duplicate the **Reseller Sales** query.

15. Rename the new query **Reseller Sales Agg**.

16. Apply a group by transformation, as follows:

    - Group by **OrderDate**.

    - New column: **Sales**, which is the sum of the **SalesAmount** column.

17. Close and apply the queries.

18. In Model view, set the storage mode for the **Reseller Sales Agg** table to **Import**.

19. Create a relationship from the **Date** table **Date** column to the **Reseller Sales Agg** table **OrderDate** column—ensure that the column cardinality is set to **one-to-many**, with the **Date** table on the one-side.

20. Manage aggregations on the **Reseller Sales Agg** table:

    - **OrderDate**: Group by the **Reseller Sales** table **OrderDate** column.

    - **Sales**: Sum the **Reseller Sales** table **SalesAmount** column.

21. Point out that the aggregation table is now hidden.

22. Switch to Report view, and in the **Performance Analyzer** pane, and then refresh the visuals.

23. Point out that the **Sales by Month** table is now queried from the model cache.

24. Drill through from any month, and point out that the details in the table are requested as DirectQuery from the data source.

25. Save the Power BI Desktop file.

26. Close Power BI Desktop.

    You will not use this Power BI Desktop solution again.

7: Create Reports
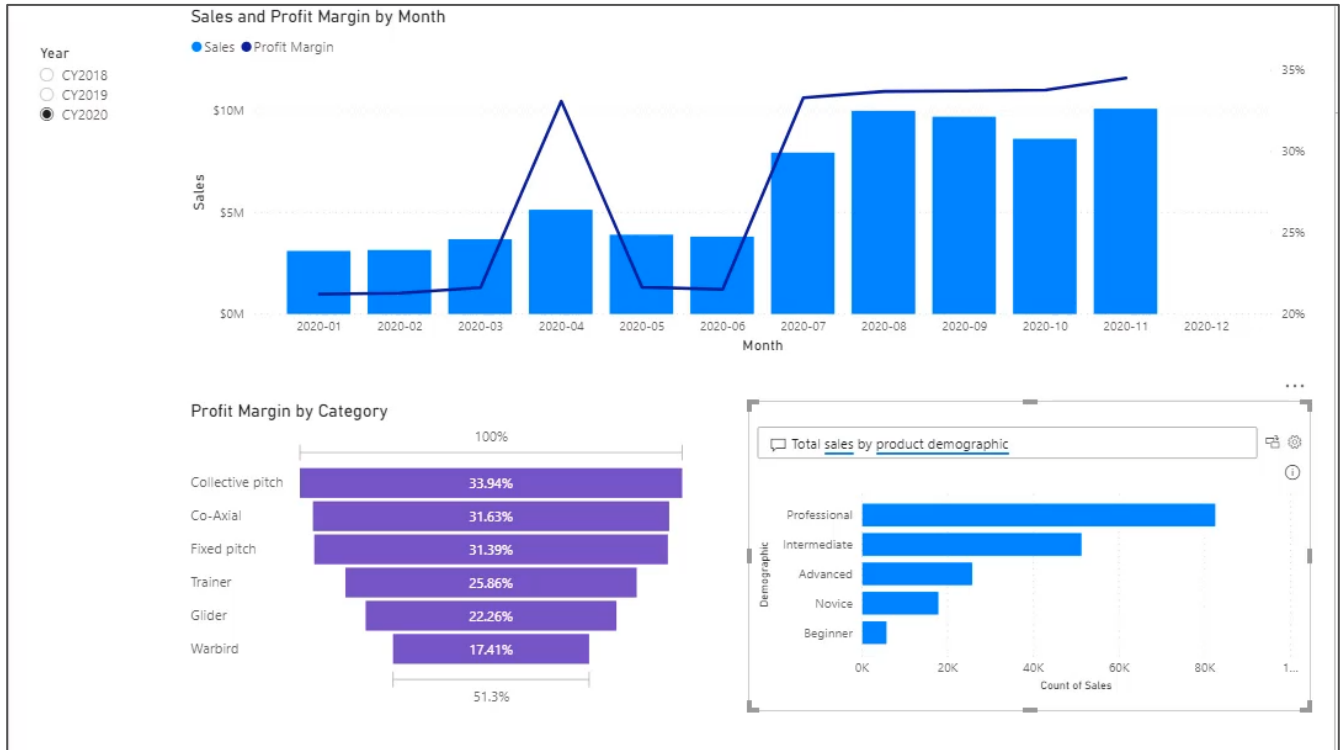
Create a single-page report

1. Remove the matrix visual that was used to test and validate the model calculations.

2. Rename the report page as **Sales Summary**.

Add a slicer

3. Add a slicer for the **Date** table **Year** column and position it at the top-left of the report page.

4. Use the formatting options to configure the slicer for single selection.

Add various visuals

5. Add a line and stacked column chart to the page, and configure it as follows:

   - Shared axis: **Date | Month**

   - Columns values: **Sales | Sales**

   - Line values: **Sales | Profit Margin**

6. Use the slicer to filter the page by **CY2019**, and then **CY2020**.

7. In the line and stacked column chart, point out that there is no sales column for December 2020.

8. Configure the shared axis to "show items with no data".

9. Point out that December 2020 is added to the axis, but there is no column of data.

10. Explain that sales data for December 2020 has not happened yet.

    You will run a script in a later demo to load December 2020 sales.

11. Add a funnel chart, and configure it as follows:

    - Group: **Product | Category**

    - Values: **Sales | Profit Margin**

12. Use the formatting options to select a contrasting data color.

13. Add a Q&A visual, and enter the following question: **Total sales by product demographic**

14. Save the Power BI Desktop file.

15. Leave the Power BI Desktop file open for a later demo.

8: Perform Data Analysis

Add a group

16. Add another new page to the report named **Category Analysis**.

17. Copy, paste, and then sync the **Year** slicer from the **Profit Analysis** page to the new page.

18. Add a new group based on the **Product** table **Category** column.

19. Create a group based on the **Trainer** value.

20. Check the **Include Other Group** checkbox.

21. Add a matrix visual, and position and size it so it fills the page.

22. Configure the matrix visual as follows:

    - Rows: **Product | Category (groups)** and **Product | Product**

    - Values: **Quantity**, **Sales**, **Profit**, and **Profit Margin** from the **Sales** table

23. Expand both categories.

Apply conditional formatting

24. In the matrix visual, apply background color conditional formatting to the **Profit Margin** field.

25. Select red for the minimum color, and green for the maximum color.

26. Point out the range of colors used to convey low-to-high profit margin values.

27. Save the Power BI Desktop file.

28. Publish the report to the newer workspace, overwriting when prompted.

29. In the Power BI service, open the **Sales Analysis** report, and interact with each of the report pages.

30. Leave the Power BI Desktop file open.

9: Create and Manage Workspaces

Share a dashboard

1. Open another Microsoft Edge window, in a new InPrivate window.

2. Sign in to the Power BI service, and accept the Power BI Pro trial license if not already done.

Open the shared dashboard

3. Switch to the instructor Power BI service window.

4. Open the **Sales Monitoring** dashboard.

5. On the menu, click **Share**.

6. Share the dashboard to the recipient account.

7. Switch to the recipient Power BI service window.

8. Open **Shared with Me** and open the **Sales Monitoring** dashboard.

9. Point out that the dashboard is read-only.

Create an app

10. Switch to the instructor Power BI service window.

11. In the **Navigation** pane, click the workspace name.

12. At the top-right, click **Create App**.

13. In the **Setup** section, enter description text and optionally choose a theme color.

14. In the **Navigation** section, optionally sequence the report before the dashboard.

15. In the **Permissions** section, grant access to the recipient account.

16. Publish the app.

Get and open the app

17. Switch to the recipient Power BI service window.

18. Open **Apps**, and then get the app you just published.

19. Once added, open the app.

20. Navigate between the report pages and the dashboard.

21. Leave the app open. *It will be used in the row-level security demo and lab*.

10: Manage Files and Datasets in Power BI

Prepare for gateway data refresh

Note that the following steps are not needed when using the data gateway in personal mode. You can proceed directly to the next objective (setup the gateway).

22. In Power BI Desktop, open the Power Query Editor window, and select the **ProductCost** query.

23. Edit the **Source** step, and then modify the file path to use the file share, as follows: **\\DATA-AI\Data\ProductCost.xlsx**

    *You can copy the file share path from the **MySettings.txt** file.*

24. Close and apply the Power Query Editor window.

25. Save the Power BI Desktop file.

26. Publish the Power BI Desktop file to the workspace, overwriting the dataset and report in the service.

Setup the gateway (personal mode)

27. In the Power BI service for the instructor, reload (F5) the dataset settings page.

28. Expand the **Gateway Connection** section and point out that no gateway is installed.

29. Use the download dropdown list (located at the top-right), and select **Data Gateway**.

30. In the new web page, download the personal mode gateway.

31. Once downloaded, open the downloaded file.

32. Complete the gateway setup by using the credentials of the instructor account.

33. Once setup, return to and reload the dataset settings page.

34. Assign the personal gateway, and the edit the credentials for the two data sources.

35. For both data sources, set the authentication method to **WindowsWithoutImpersonation**, and set the privacy level to **Organizational**.

36. Optionally, expand the **Scheduled Refresh** section, and show how to configure a recurring schedule.

Refresh the dataset

37. Before refreshing the dataset, open the **Sales Monitoring** dashboard.

38. Edit the details of the **Sales, Profit Margin** tile to display the last refresh time.

39. Right-click the **D:\PL300\Demo\Resources\UpdateDatabase-LoadAdditionalSales.ps1** file, and then run with PowerShell.

    A script will load December 2020 sales data into the database.

40. In the Power BI service for the instructor, from the **Navigation** pane, refresh the **Sales Analysis** dataset.

41. When the refresh completes, point out how the dashboard tile December 2020 column appears, and that the refresh time is NOW.

11: Create Dashboards
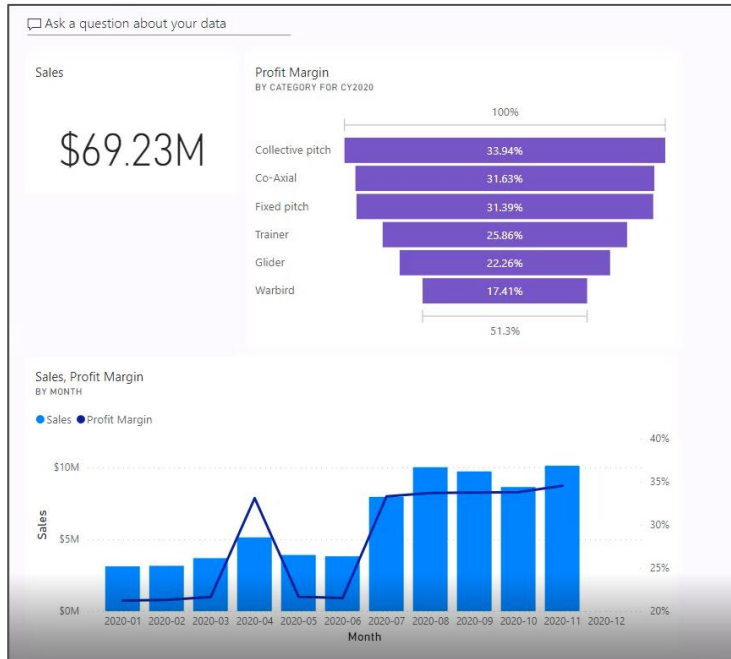
Create a dashboard

1. First, in the Power BI service, create a new workspace, and use the **D:\PL300\Demo\Resources\Icon-Airplane.jpg** image as its icon.

2. In Power BI Desktop, publish the **Sales Analysis** report to the new workspace.

3. Once published, return to the Power BI service.

4. Open the **Sales Analysis** report, and then ensure the **Year** slicer is set to **CY2020**.

Pin report visuals

5. Pin the line and stacked column chart to create a new dashboard named **Sales Monitoring**.

6. Pin the funnel chart to the new dashboard.

7. Open the **Sales Monitoring** dashboard.

8. Edit the details of the **Profit Margin** tile and change the subtitle text to include the year (CY2020).

Add Q&A tile

9. Use Q&A on the dashboard to ask the following question: **Total sales in CY2020**

10. Pin the response to the dashboard.

11. Show how to resize and reposition the tiles.

12: Row-level Security

Add a security table to the model

1. In Power BI Desktop, open the Power Query Editor window, and add a new query based on the **D:\Demo\Data\ManagerCategory.xlsx** file (use the **ManagerCategory** Excel table).

2. Remove the **Manager** column.

3. Split the **Category** column by the semicolon delimiter and split into rows (advanced options).

4. In the **Email** column, replace the value **ty-johnston@tailspintoys.com** with the recipient account (from the **MySettings.txt** file).

5. Point out that this user is able to see three product categories: Collective pitch, Trainer, and Warbird.

6. Close and apply the queries.

7. In Model view, create a relationship between the **ManagerCategory** and **Product** tables relating the **Category** columns.

8. Set the cross filter direction to **Single (ManagerCategory filters Product)**.

9. Hide the **ManagerCategory** table.

Add a role

10. In Report view, open **Manage Roles**, and then create a role named **Manager**.

11. In the role, filter the **ManagerCategory** table **Email** address column as follows:

    DAX
    ```
    [Email] = USERPRINCIPALNAME()
    ```

12. Click **Save**.

Validate the role

13. Open **View As**, and then configure the following settings:

    - Other User: Check, then enter the recipient account.

    - Manager role: Check

14. Point out that the filter visual shows just three product categories.

15. Stop viewing the report using the view-as options.

16. Save the Power BI Desktop file.

17. Publish the Power BI Desktop file to the workspace, overwriting the dataset and report in the service.

18. Close Power BI Desktop.

Configure dataset security

19. In the Power BI service for the instructor, from the **Navigation** pane, open the security page for the **Sales Analysis** dataset.

20. In the **Members** section, enter the recipient account (representing Ty Johnston).

21. Click **Add**.

22. Click **Save**.

Test row-level security in the app

23. In the Power BI service for the recipient, refresh the dashboard (left open from the previous demo).

24. In the Profit Margin dashboard tile, verify that only three product categories can be seen.