



IBM Cognos Analytics

Getting Started with 11.2 Data Modules Workshop

Workshop Guide

CA 11.2.0 / July 2021

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1 Introduction

With Cognos Analytics, users are not restricted to existing enterprise data sources. The data blending and modeling capabilities in Cognos Analytics allows the business user to include external data sources without requiring assistance from IT. This does not replace IT, it simply augments the user experience to allow the user to work with personal data sets and analyze that data in conjunction with the enterprise data.

Users can import external data from files on premise, data sources and cloud data sources into Cognos Analytics. Multiple data sources may be shaped, blended, cleansed and joined together to create a custom, reusable and shareable data module for use in dashboards and reports.

In this workshop, you will experience the following capabilities in IBM Cognos Analytics:

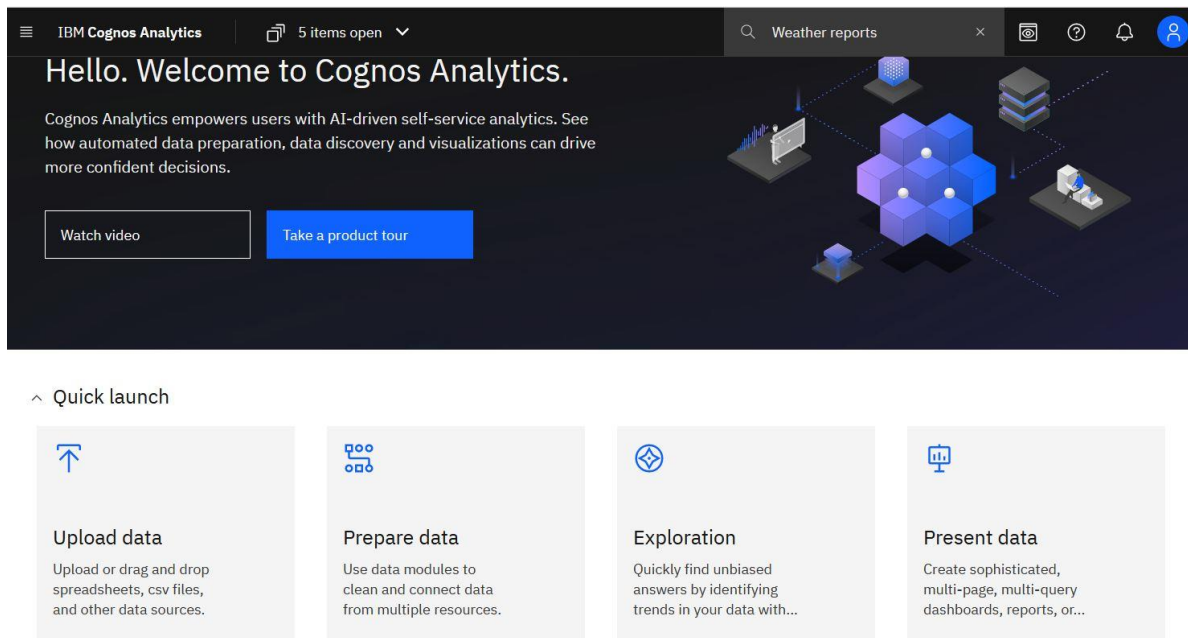
- Upload data files
- Create a data module
- Create joins
- Customize
- Test

2 Get Started with your Cognos Analytics Tutorial

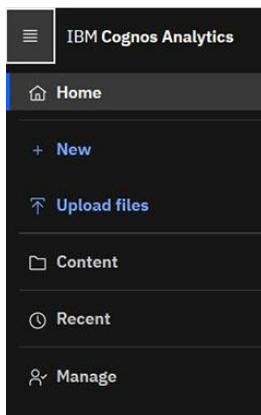
2.1 Cognos Analytics User Interface

The goal of the User Interface (UI) is to provide users with a streamlined way to get started using Cognos Analytics and view content and activities pertinent to them.

1. The welcome page provides quick access to the product functionalities, content, samples, and learning materials. This is the perfect place to start exploring Cognos Analytics.



2. The **Open menu** is the main access point to the IBM Cognos Analytics content and functionalities. Click the **Open menu** icon in the application bar to access the menu options.



For additional information see [Welcome Page](#) in the online IBM Documentation.

2.2 Business Use Case for this Workshop

You have just received the following email asking for your assistance:

Good morning!

As you know, we just finalized the acquisition of CAWS, Inc. During conversations with our executives, there was some concern over performance of a few of their product lines. We have received a few files on Customer Loyalty programs, claims and churn which we would like to start working with now, and then tie in to their full data once it is integrated into our systems.

Would there be a way for you work your magic on all this data and somehow merge them together, so we can begin analyzing what we have?

Thanks!

With Cognos Analytics' data module capabilities, you can blend data from multiple disparate systems such as uploaded files, databases, etc. You'll start with uploading the data files, so you may build out a data module to have a single source of integrated data to work with for analysis.

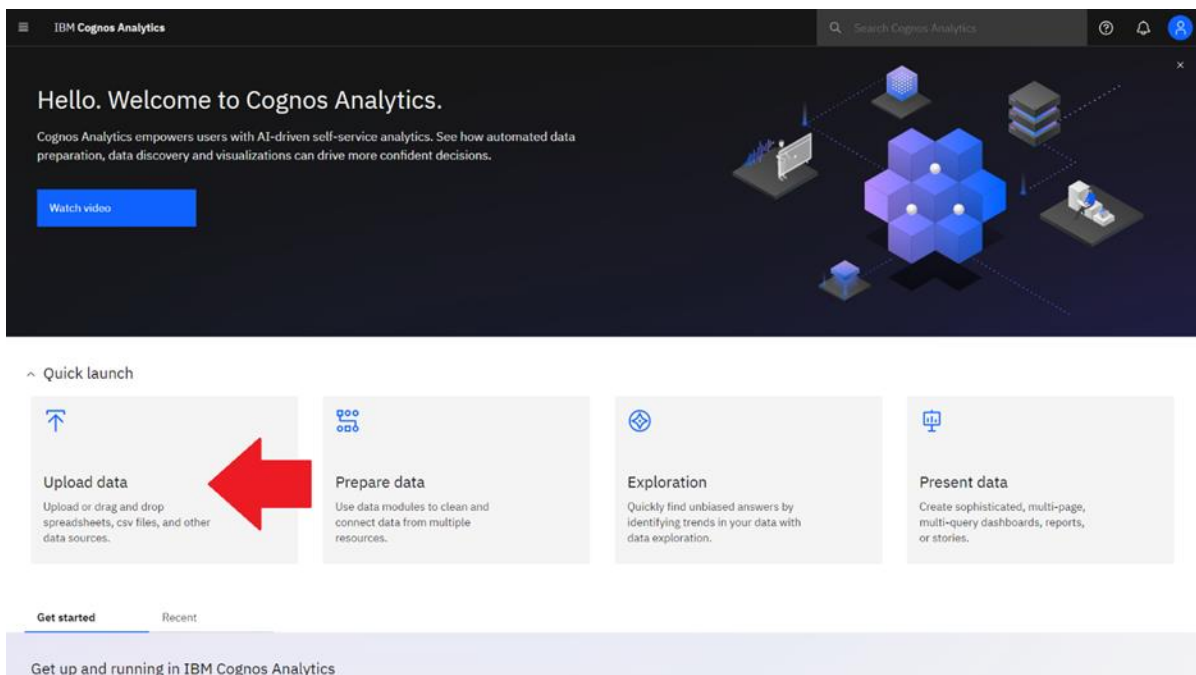
3 Building a Data Module

3.1 Uploading External Data Files

The ability for business users to leverage their personal/external data for discovery dramatically broadens the landscape of users who can make new data available for analysis. Users may upload an external data file and immediately begin self-service data discovery, ad hoc analysis and building dashboards, data modules and reports.

For this exercise you wish to combine existing Customer Loyalty Program information with Customer Churn information and Customer Claim analysis. You have this information in various files which you can upload directly into Cognos Analytics and blend, cleanse and model for use in your analysis. For the first upload, you want to include your Customer Churn information for customers who had, or currently have, cell phone plans that are part of your Loyal customers program.

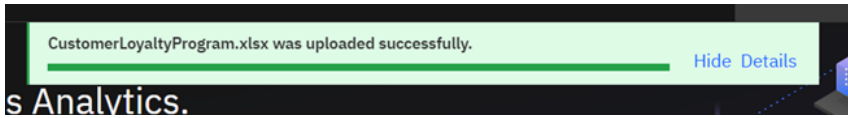
1. The files you will use for this workshop can be downloaded here:
 - [CustomerLoyaltyProgram.xlsx](#)
 - [CustomerChurn.xlsx](#)
 - [CustomerClaimAnalysis.xlsx](#)
2. To upload a file, click the **Upload** data tile in the **Quick** launch section of the Welcome page. Navigate to the file you downloaded above named *CustomerLoyaltyProgram.xlsx* and click **Open**.



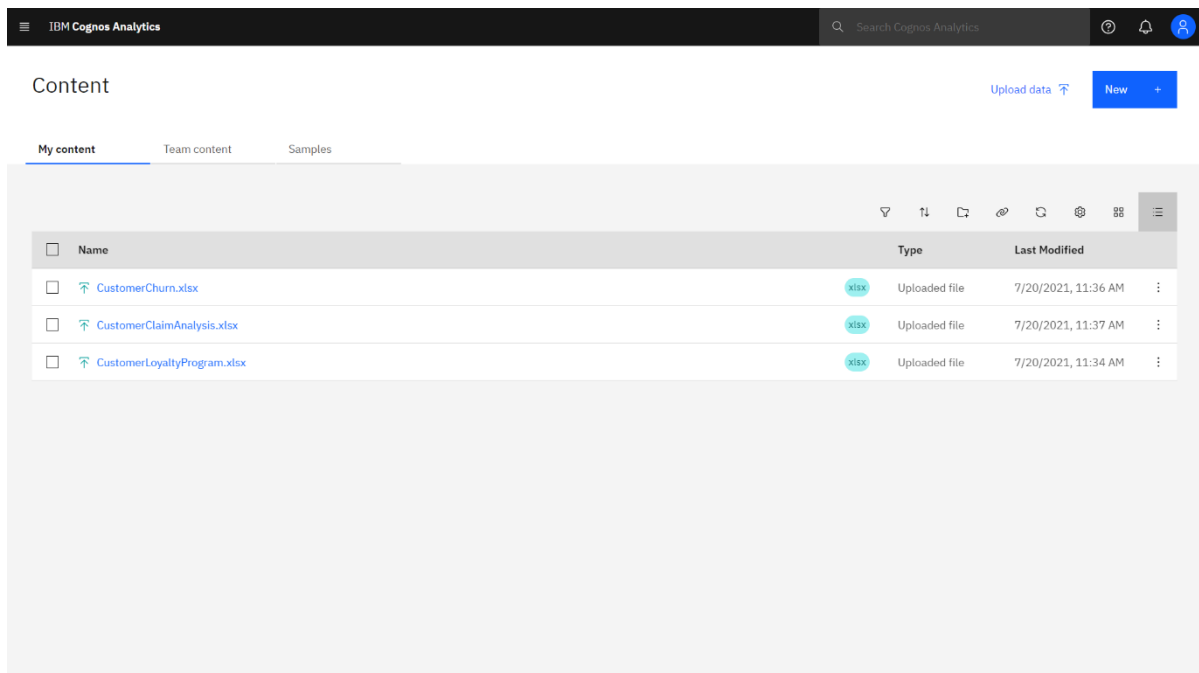
- ___3. As the file uploads, notice that under the Switcher, a series of **status bars** will be visible as the upload process reads and analyzes the data being brought in.



- ___4. Once it completes, the status bar will update to show the successful completion before closing.

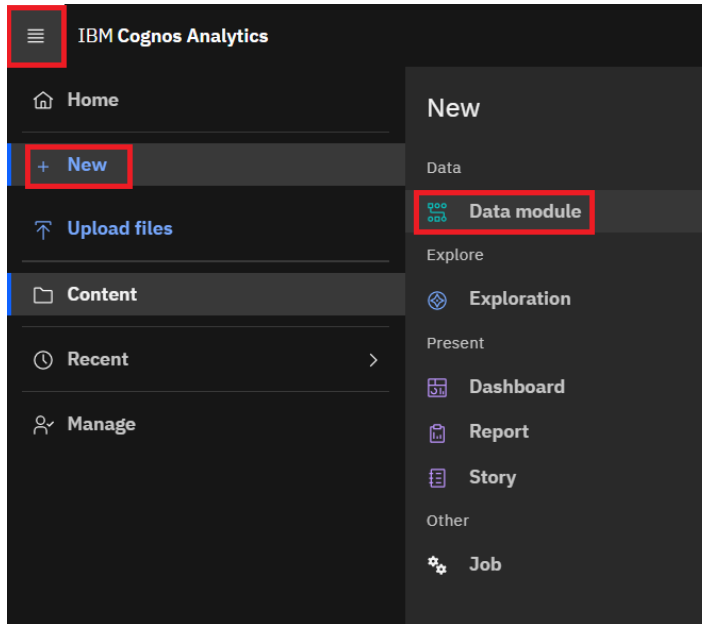


- ___5. The uploaded file will now show in the **Recent** tab on the Welcome page.
- ___6. For the next upload, you want to include customer churn information. Repeat the upload steps for the file named "*CustomerChurn.xlsx*"
- ___7. For the last upload, you want to include customer claim analysis data. Repeat the upload steps for the file named "*CustomerClaimAnalysis.xlsx*"
- ___8. Once the uploads are complete, the three files are available on the **Recent** tab on the Welcome page, and in the **My content** tab, which you can access from the **Open menu** by selecting **Content**.

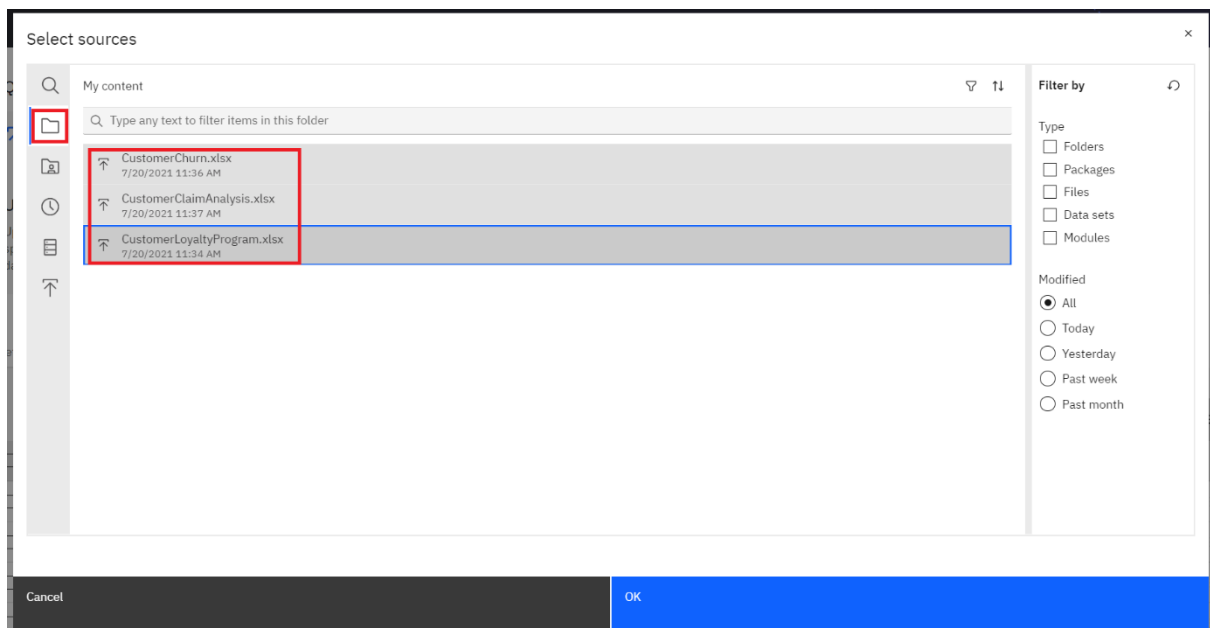


3.2 Working with Data Sources




- __1. From the **Open** menu, click **New**, then **Data module**.



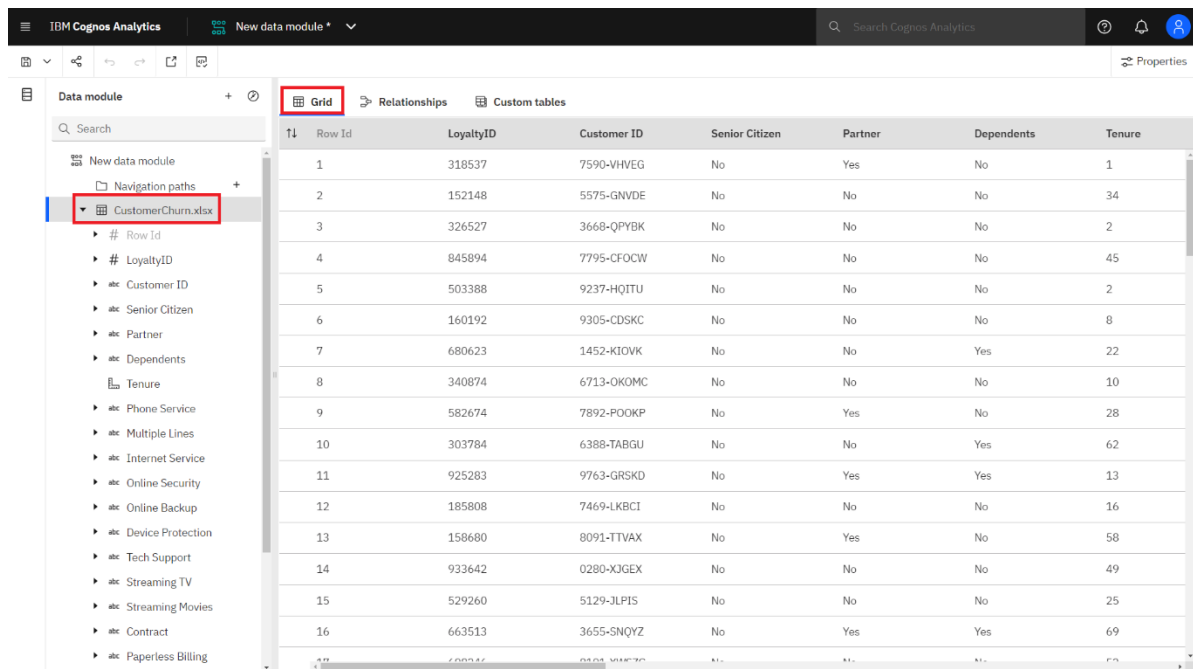
- __2. The **Select sources** dialog will appear. From here you may use search and filtering options to sort or locate different source types and recently accessed files to select content to include in the data module. Multi-select the three files you just uploaded from **My content** and click **OK**.



3. The data module will open with the **Data module** panel on the left, and the canvas on the right. At the top left of the canvas, you will see that there are three tabbed views available:

-  **Grid** shows the data values.
-  **Relationships** provides a visual representation of how the tables are related.
-  **Custom tables** provides a visual breakdown of how the different views and tables were created and their individual components.

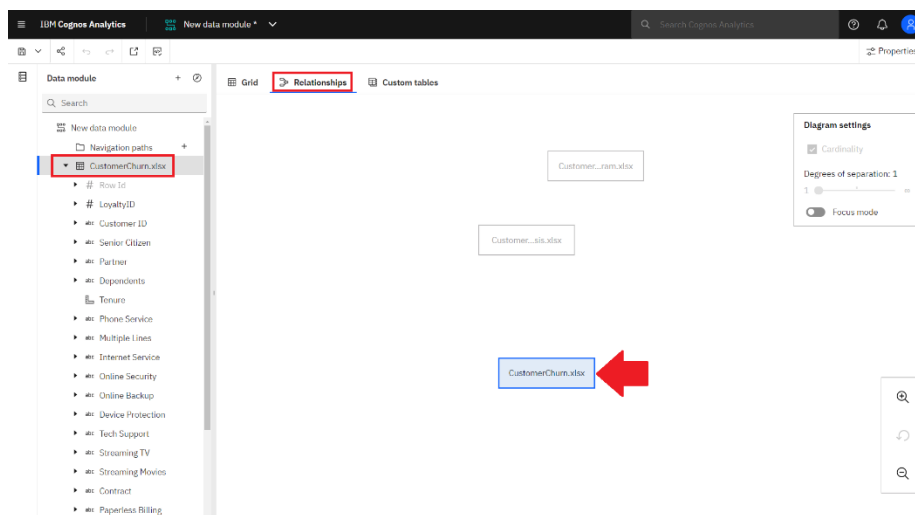
4. By default, Cognos Analytics opens with the **Grid** view of the data. Click on **CustomerChurn.xlsx** to preview the data.



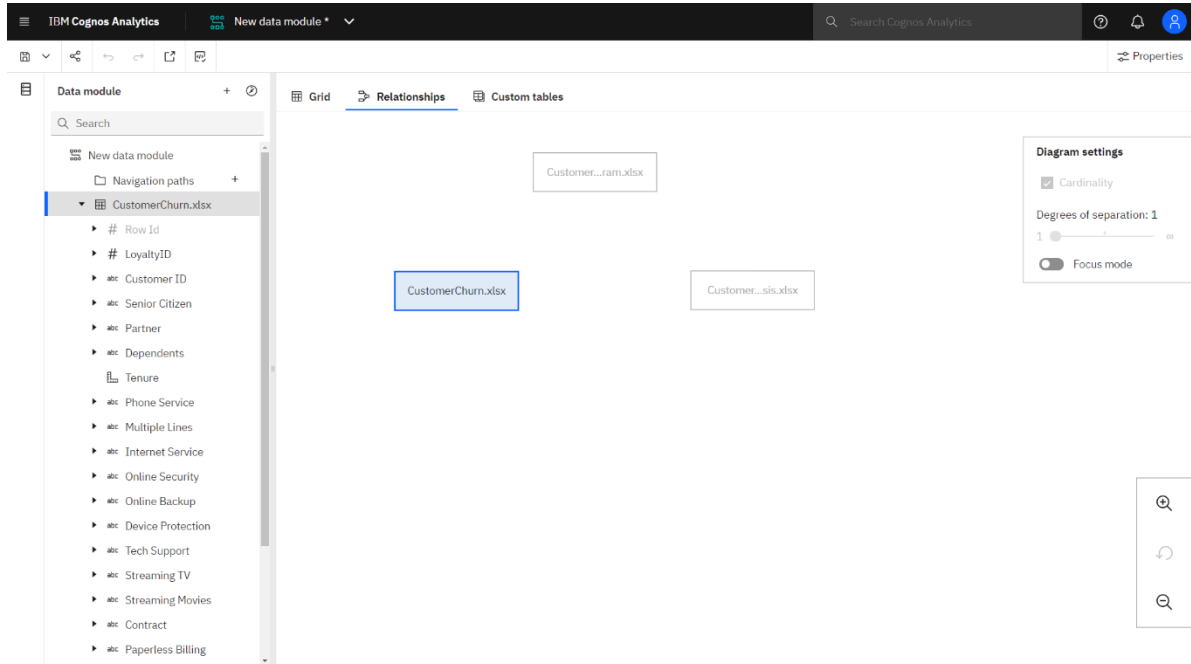
The screenshot shows the IBM Cognos Analytics interface. The top navigation bar includes the IBM Cognos Analytics logo, a search bar, and user profile information. The main area is divided into a left sidebar and a central canvas. The sidebar, titled 'Data module', contains a search bar and a tree view of data sources. The 'CustomerChurn.xlsx' source is selected and highlighted with a red box. The central canvas displays the 'Grid' view of the data, with columns for Row Id, LoyaltyID, Customer ID, Senior Citizen, Partner, Dependents, and Tenure. The data is presented in a table with 16 rows.

Row Id	LoyaltyID	Customer ID	Senior Citizen	Partner	Dependents	Tenure
1	318537	7590-VHVEG	No	Yes	No	1
2	152148	5575-GNVDE	No	No	No	34
3	326527	3668-QPYBK	No	No	No	2
4	845894	7795-CFOCW	No	No	No	45
5	503388	9237-HQITU	No	No	No	2
6	160192	9305-CDSKC	No	No	No	8
7	680623	1452-KIOVK	No	No	Yes	22
8	340874	6713-OKOMC	No	No	No	10
9	582674	7892-POOKP	No	Yes	No	28
10	303784	6388-TABGU	No	No	Yes	62
11	925283	9763-GRSKD	No	Yes	Yes	13
12	185808	7469-LKBCI	No	No	No	16
13	158680	8091-TTVAX	No	Yes	No	58
14	933642	0280-XJGEX	No	No	No	49
15	529260	5129-JLPIS	No	No	No	25
16	663513	3655-SNOYZ	No	Yes	Yes	69

5. Click the **Relationships** view. You will now see a diagram showing each of the three data files brought into the data module. Notice that **CustomerChurn.xlsx** is highlighted as it is the one that is currently in focus.

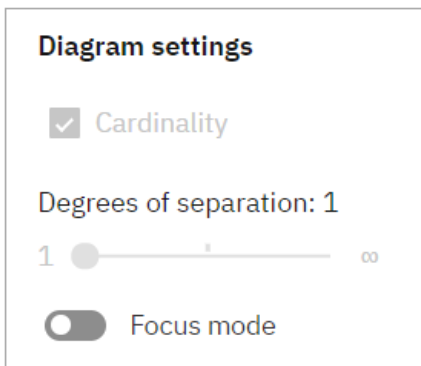


- ___6. You may click on each table and move it around the screen to modify the layout to your preference. Click on the **tables** and **drag** them into the configuration shown below.

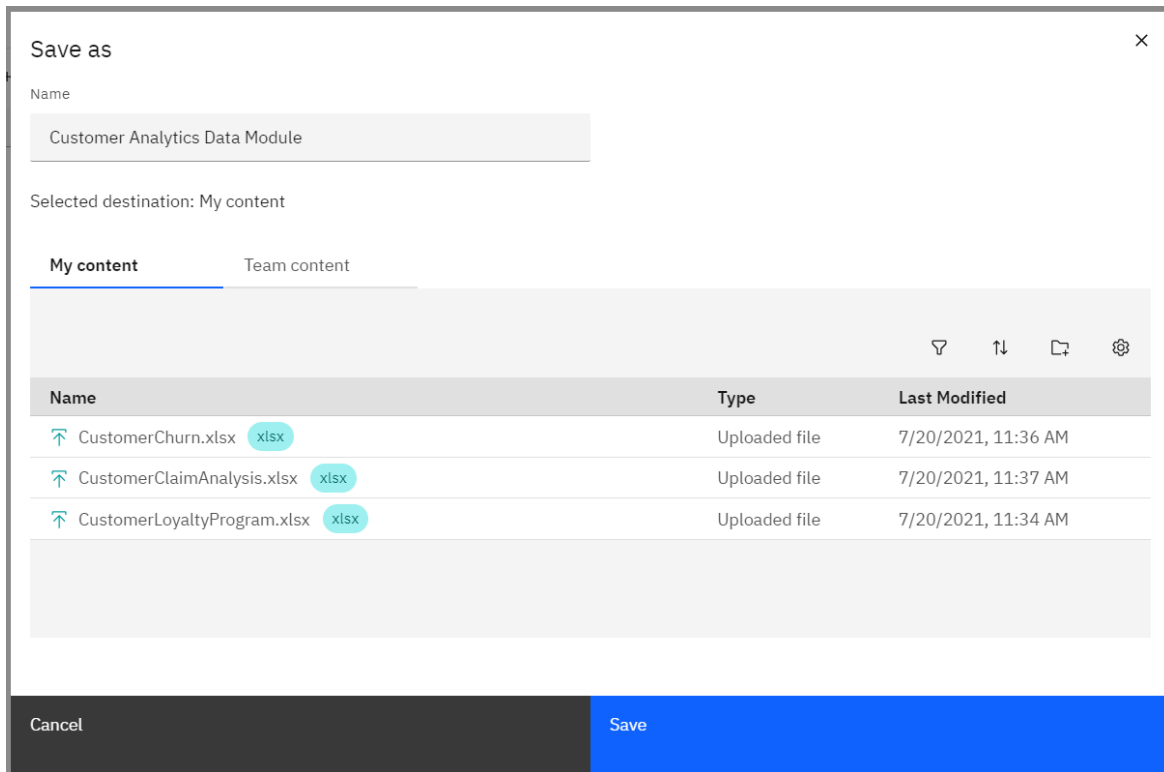


To move the entire diagram at once, you may click in the white space and drag while holding down the left mouse button. You may also zoom in/out on the diagram using the Zoom buttons on the lower right corner of the canvas.

- ___7. On the top right of the canvas is the **Diagram settings** box. This box will remain greyed out until some joins between the tables have been defined.



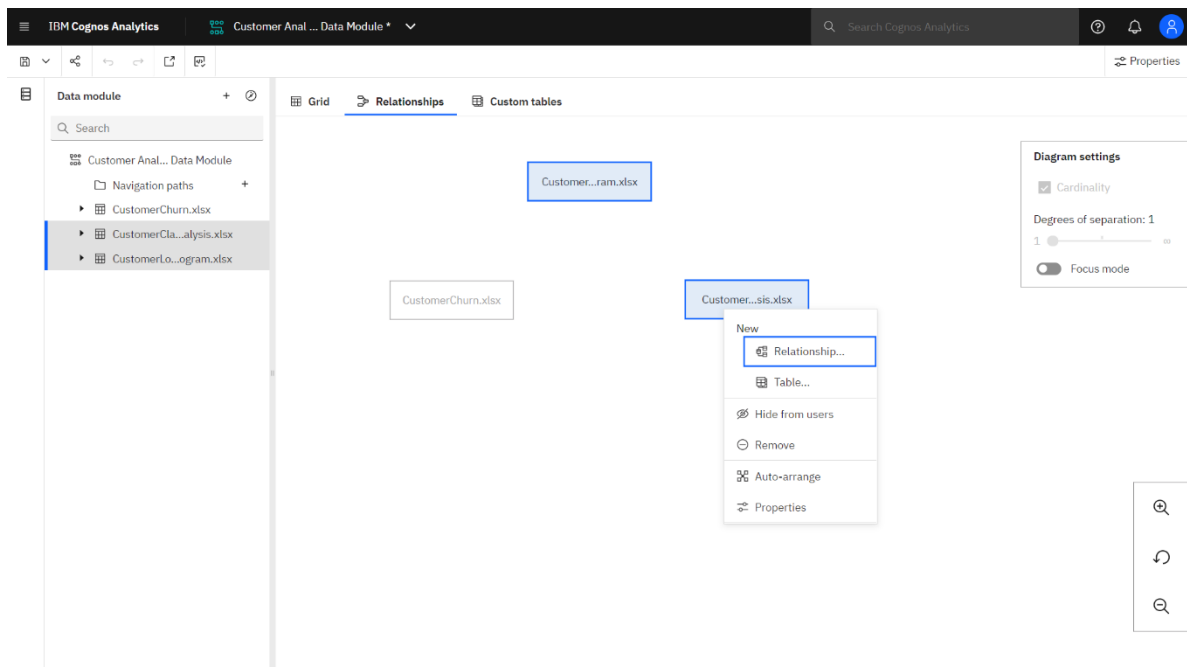
8. Click on the down arrow next to the **Save** icon on the main toolbar. Select **Save As**. Click the **My content** tab. Type “*Customer Analytics Data Module*” in the **Name** textbox. Click **Save**.



3.3 Working with Joins

*You will create two join relationships between the imported objects. The first relationship you will define is between **CustomerLoyaltyProgram.xlsx** and **CustomerClaimAnalysis.xlsx**.*

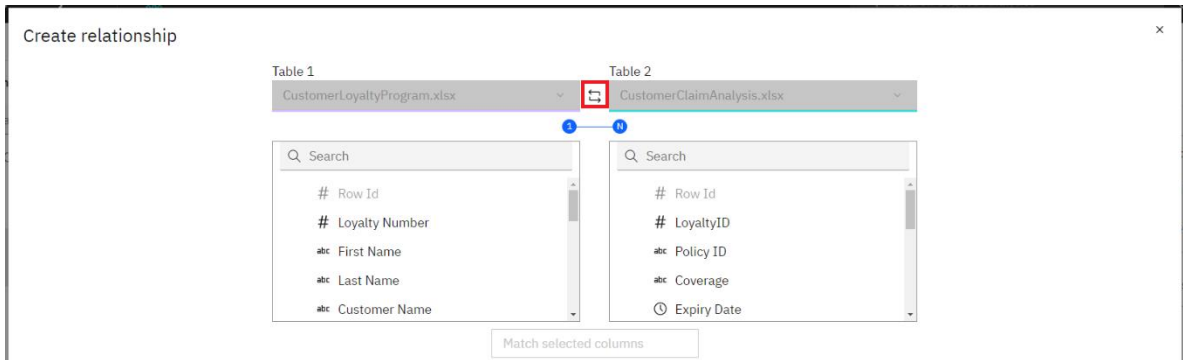
1. From the **Relationships** tab, select **CustomerLoyaltyProgram.xlsx** and then control-click **CustomerClaimAnalysis.xlsx**. Both tables will be highlighted to indicate they are in focus. Right-click and select **Relationship...**



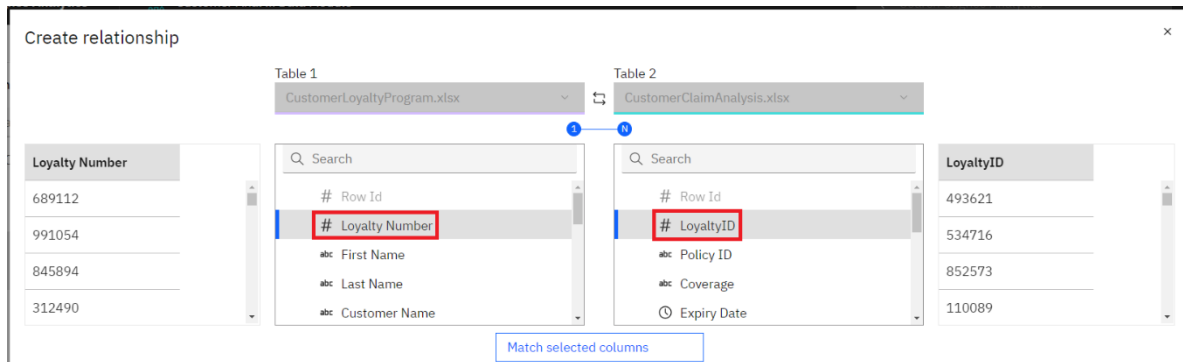
*Users may also start creating a relationship by selecting any single table, right-clicking, and selecting **Relationship...** from the context menu.*

*The **Create relationship** dialog will appear. The window is organized to step you through the join definition. The window shows each table in the join and columns/fields available for the join.*

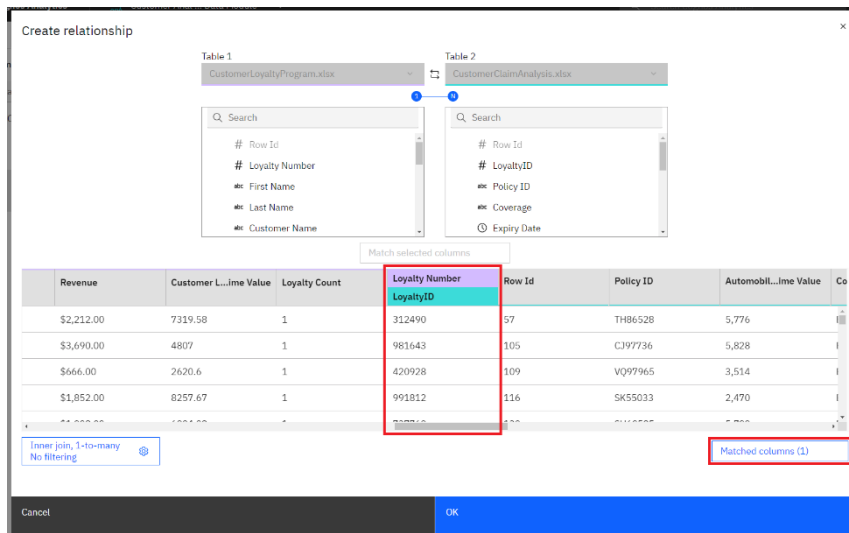
2. At the top of the dialog, it shows the selections made for setting up the join relationship. For this exercise, we are working with **CustomerLoyaltyProgram** on the left and **CustomerClaimAnalysis** on the right. If this is not the case, use the **Switch left and right tables** icon to place your tables in this order.



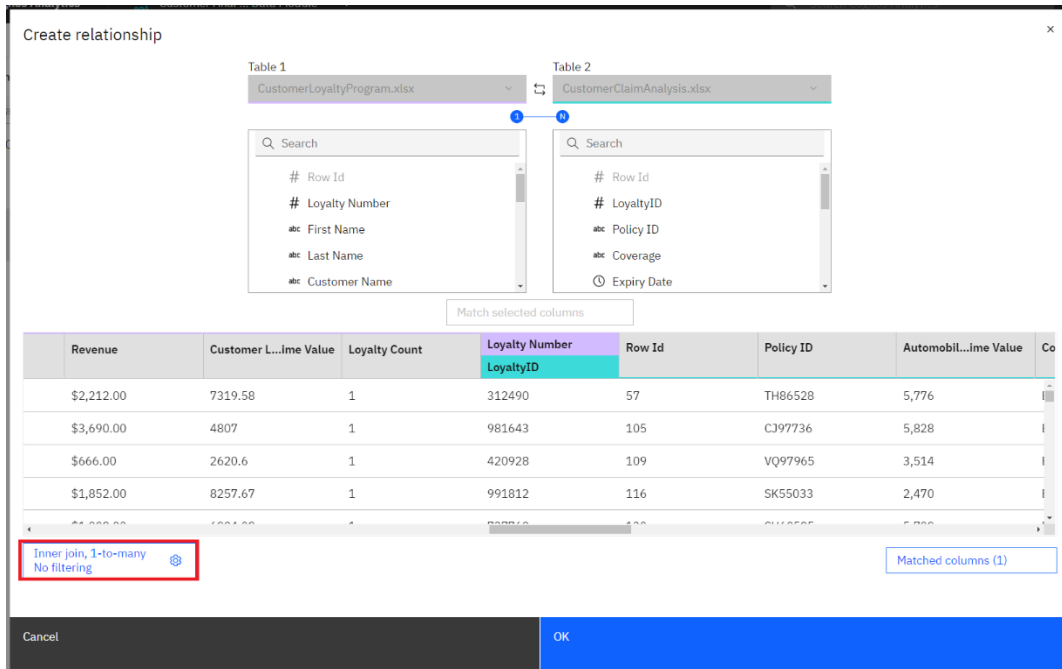
3. In the **Create relationship** window, you can see that the common data between the two files is Loyalty Number/LoyaltyID. Using the pick lists, select **Loyalty Number** from CustomerLoyaltyProgram and select **LoyaltyID** from CustomerClaimAnalysis.



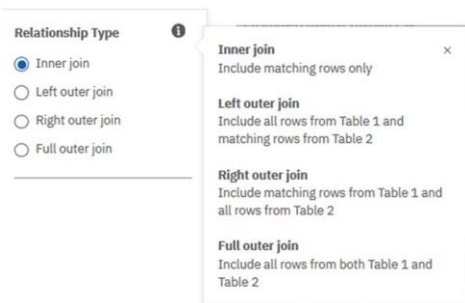
4. Click the **Match selected columns** button, then click the **Refresh** button to update the viewer to show the joined tables. Use the scroll bar to see all the fields.



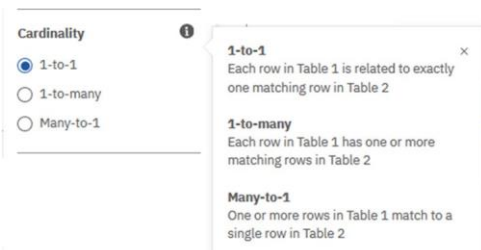
5. The **Join settings** in the lower left corner show the rules (logic) setup for the join behavior. Click on the **Join settings** to open the join definitions.



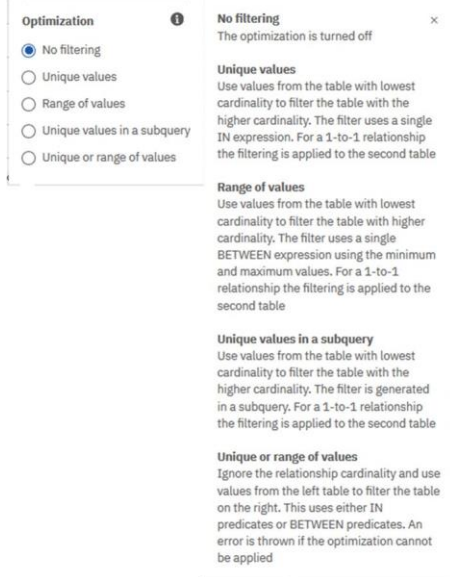
6. There are many ways to join data between files. The goal of the join is to ensure that the relationship between the two files creates a unique record. For **Relationship type**, this join is set to **Inner Join**. This will include *matching rows only* between the two files, meaning it will only return records that exist in both files. Make no changes to the relationship type.



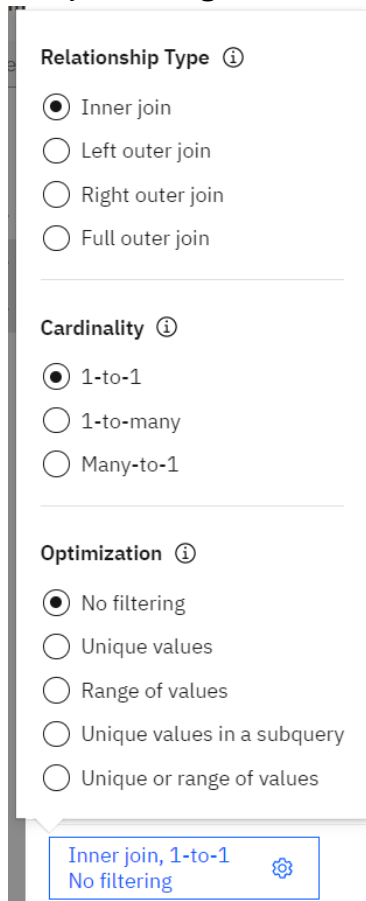
7. **Cardinality** refers to number of occurrences of the data item in each of the data sets. For this join, each of these tables is a master list of products and names respectively, so each record is unique. Click on the radio button next to **1-to-1** to change the cardinality.



__8. **Optimization** provides automated filtering options based on the values between the tables. Make no changes to the optimization.



__9. Your join settings should now appear as follows:



- __10. Click **Refresh** to update the preview of the joined data.
- __11. Click **OK**.

*If multiple joins are needed to create a unique record, the user may add joins by repeating the process above and selecting the data items to join on and selecting **Match selected columns** to complete the join.*

- __12. You can now see a 1-to-1 relationship is created between the two files.



The next relationship you will define is between **CustomerLoyaltyProgram.xlsx** and **CustomerChurn.xlsx**.

- __13. On the **Relationships** tab, select **CustomerLoyaltyProgram.xlsx** and then control-click **CustomerChurn.xlsx**. Both tables will be highlighted to indicate they are in focus. Right-click and select **Relationship...**
- __14. Repeat the previous steps to create a join. With the **CustomerLoyaltyProgram** table on the left and the **CustomerChurn** table on the right, set the relationship settings as follows
- Create a join relationship using **Loyalty Number** from the Customer Loyalty Program table and **LoyaltyID** from the Customer Churn table
 - Make no changes to **Relationship Type**
 - Set **Cardinality** to **1-to-1**
 - Make no changes to **Optimization**

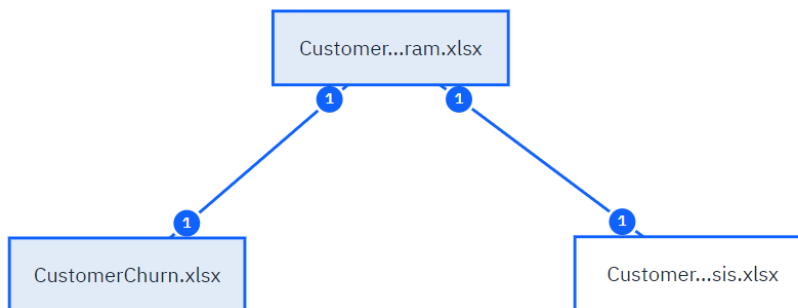
__15. Your join settings should now appear as follows. Click **OK** to dismiss the **Create relationship** dialog.

The dialog box is titled "Relationship Type" and contains three sections: "Relationship Type", "Cardinality", and "Optimization".

- Relationship Type:** Includes radio buttons for "Inner join" (selected), "Left outer join", "Right outer join", and "Full outer join".
- Cardinality:** Includes radio buttons for "1-to-1" (selected), "1-to-many", and "Many-to-1".
- Optimization:** Includes radio buttons for "No filtering" (selected), "Unique values", "Range of values", "Unique values in a subquery", and "Unique or range of values".

At the bottom of the dialog, a summary box displays "Inner join, 1-to-1" and "No filtering" with a gear icon for settings.

__16. Your resulting diagram should now appear as follows:



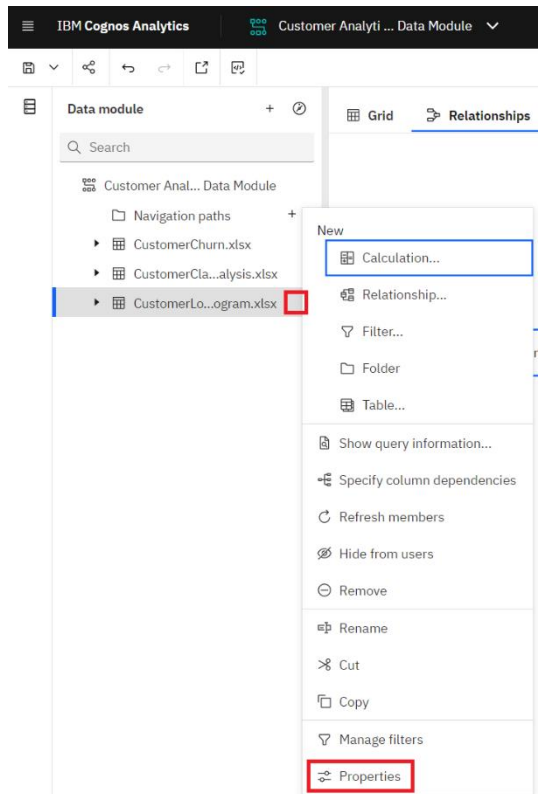
__17. **Save** the data module.

4 Customizing the Data Module

4.1 Working with Table Properties

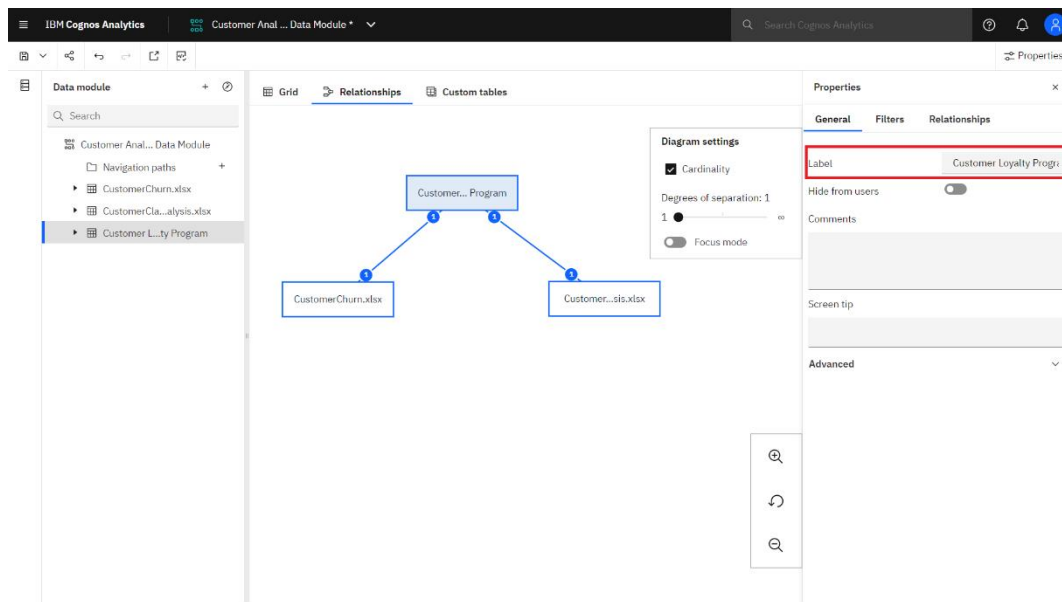
You can modify the properties of the data tables for better usability for your business users working with the data module: table names, comments and screen tips, data usage types, etc.

1. Click the **CustomerLoyaltyProgram.xlsx** table. Click the **ellipse (...)** to the far right of the table name to open the options. Select **Properties**.



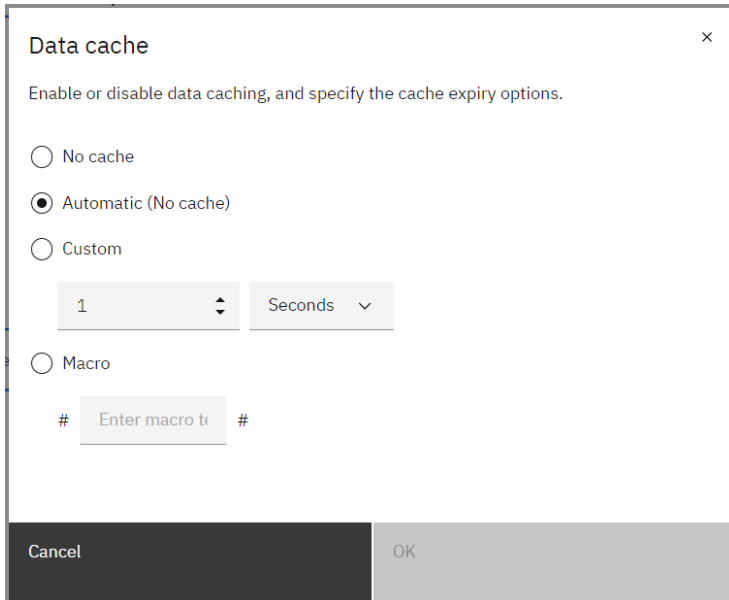
You can see in the context menu that we could also create relationships from this interface, as well as many more actions which are covered later in the workshop.

- ___2. The **Properties** panel opens to the **General** tab. From here you can change the label, choose to show/hide the table to users, and add comments and screen tips for the table. Change the **Label** to “*Customer Loyalty Program*” and click **Enter**.

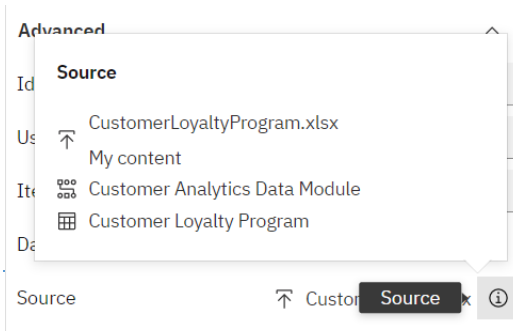


- ___3. Enter **Comments** or a **Screen tip** if you desire.
- ___4. Click the down arrow next to **Advanced** to show the list of advanced features for this table. This section shows you the table identifier, allows you to set the table usage and data cache, and shows the data source for the table (in this case the original uploaded file’s name), folder containing the data file, and the name of the table created in the data module.
- ___5. The **Usage** property allows you to set the usage for the table:
- **Automatic.** Specifies that the query engine will detect if the query subject is a dimension or a fact.
 - **Bridge.** Specifies that the query subject refers to a bridge table.
 - **Summary.** Specifies that the query subject will be treated as a summary query.

- __6. **Data cache.** You may use the data cache rules to enable or disable data caching, and specify the cache expiry options.



- __7. The **Source** property provides the user with lineage information.



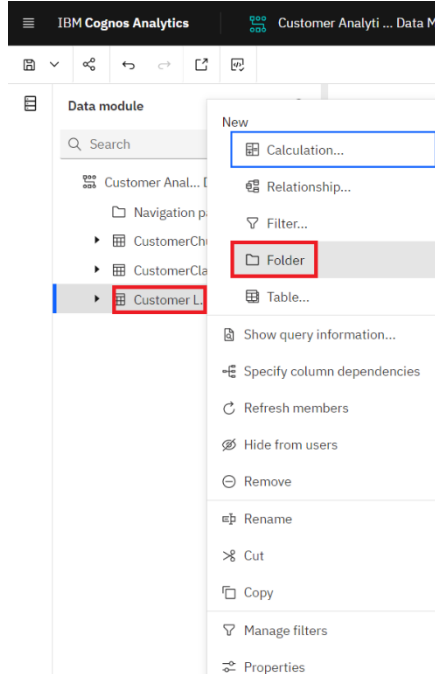
For the purposes of this workshop, you will make no changes to the Properties settings at this time. You will work more with Properties later in the workshop.

- __8. Close the **Properties** panel by clicking the **X** icon in the upper right corner of the panel.
- __9. **Save** the data module.

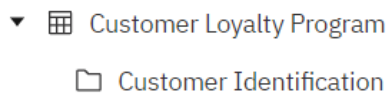
4.2 Create Table Folders

The Customer Loyalty Program table contains a lot of great information regarding customer data, location, demographics and purchase history. You want to organize this information into folders for each of these areas.

- __1. Right-click **Customer Loyalty Program**. In the context menu, under **New**, select **Folder**.




- __2. Name the folder “*Customer Identification*”.



- __3. Repeat these steps three more times to create the following folders:

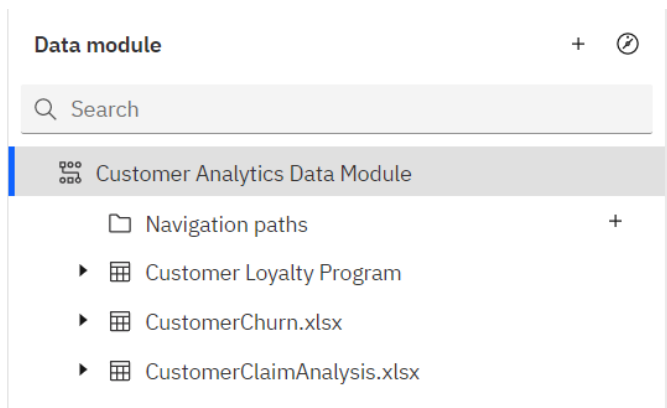
- *Customer Location*
- *Customer Demographics*
- *Loyalty Program Details and Measures*

__4. The folders are added to the top of the data item list, just under the table name.

- ▼  Customer Loyalty Program
 - Loyalty Program Details and Measures
 - Customer Demographics
 - Customer Location
 - Customer Identification

You can use drag and drop to reorder the tables and folders to display them in your preferred order.

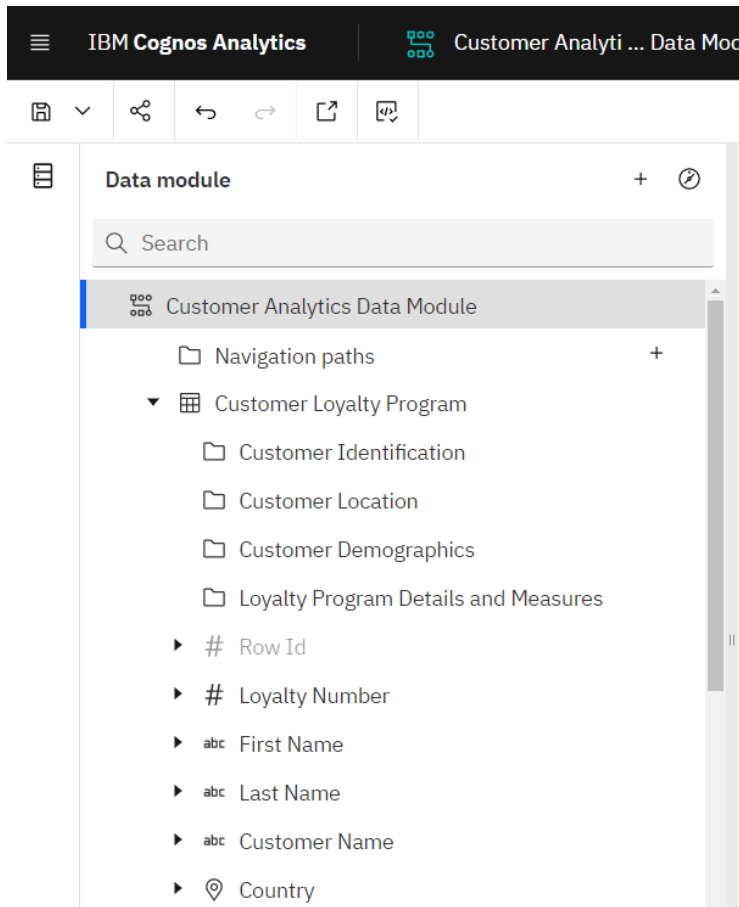
__5. Reorder the tables by dragging **Customer Loyalty Program** above **CustomerChurn.xlsx**. A blue bar will indicate the drop zone.



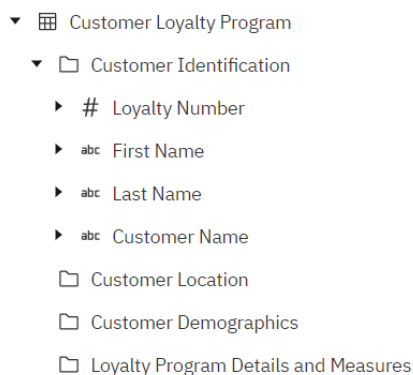
__6. Reorder the **newly created folders** by dragging and dropping them into the following order:

- Customer Identification
- Customer Location
- Customer Demographics
- Loyalty Program Details and Measures.

- ___7. Your data module should look like this, with the **Customer Loyalty Program** table as the first table in the list.

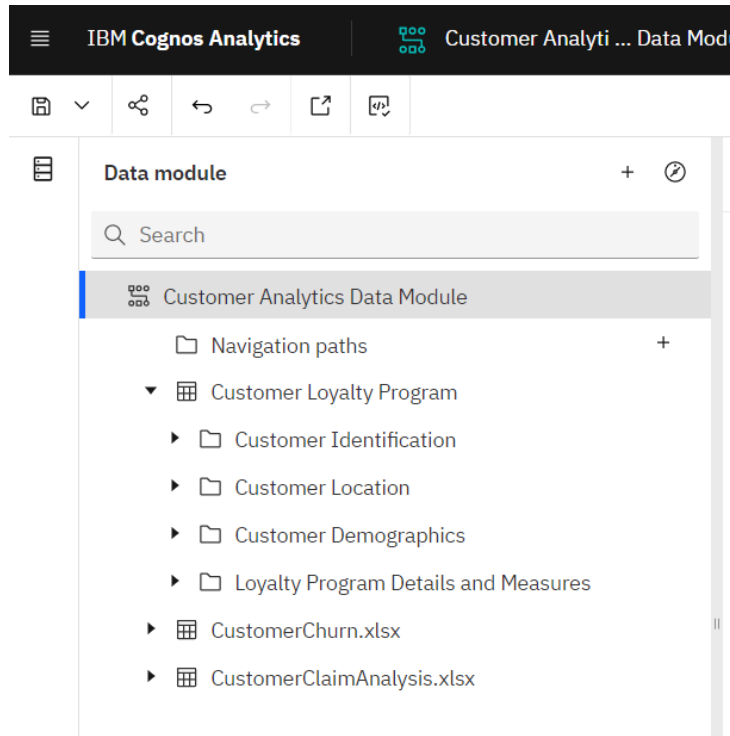


- ___8. From the **Customer Loyalty Program** table, multi-select the columns **Loyalty Number**, **First Name**, **Last Name**, and **Customer Name**. Drag them into (on top of) the **Customer Identification** folder. Blue bars above and below the table name will indicate the drop zone.



- ___9. From the **Customer Loyalty Program** table, multi-select the columns **Country**, **Province or State**, **StateAbbr**, **City**, **Latitude**, **Longitude**, **Postal code** and **Location Code**. Drag them into the **Customer Location** folder.

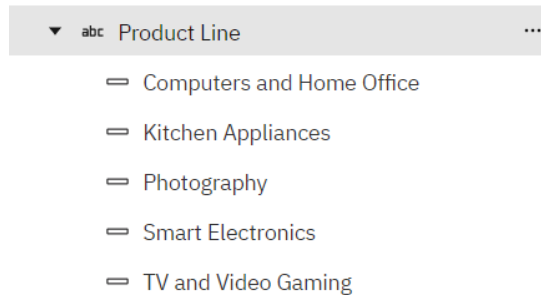
- __10. From the **Customer Loyalty Program** table, multi-select the columns **Education** and **Income**. Drag them into the **Customer Demographics** folder.
- __11. Notice that as the data items were organized into the folders, they no longer appeared in the original table list. From the **Customer Loyalty Program** table, multi-select all remaining data items. Drag them into the “**Loyalty Program Details and Measures**” folder.



- __12. **Save** the data module.

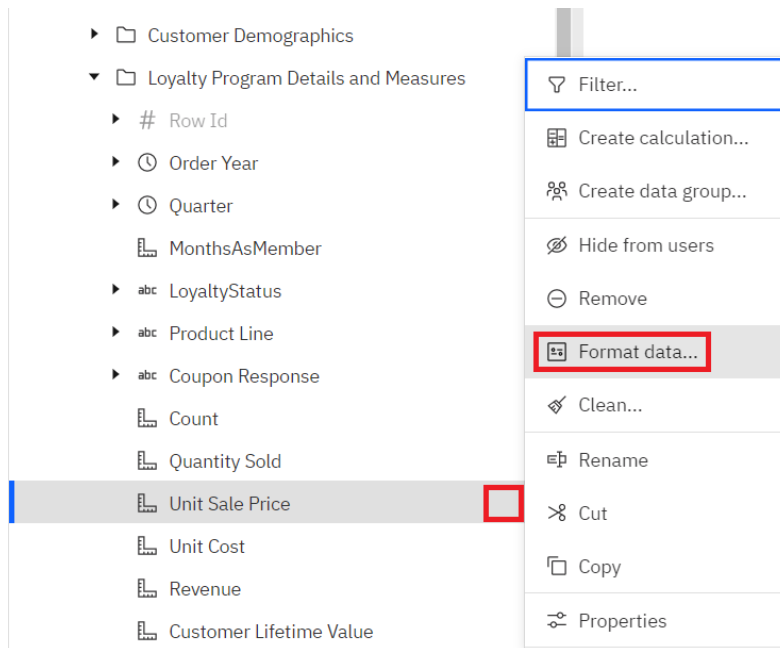
4.3 Working with Data Properties

1. As you look at the data items listed, you will notice many of the data items have Expand arrows next to them. This allows the user to open the metadata tree to see individual values or members. From the **Customer Loyalty Program** table, in the **Loyalty Program Details and Measures** folder, click on the **Expand** arrow next to **Product line**. Click again to collapse the member tree.

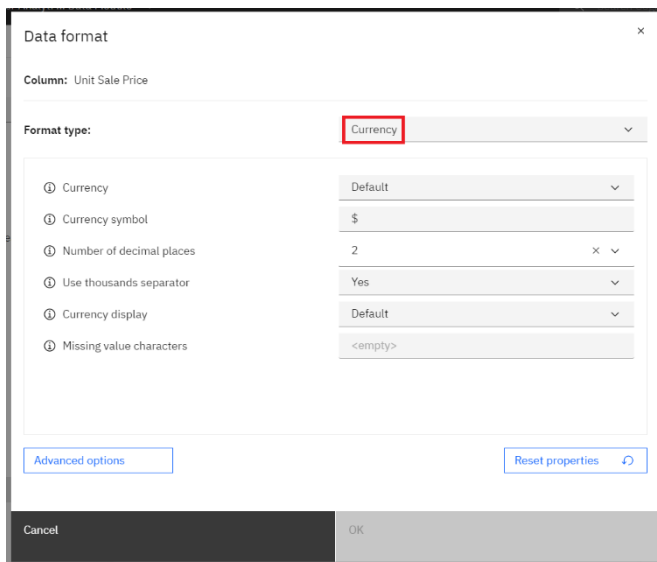


2. **Hidden fields.** Notice that **Row Id** is greyed out. This indicates the item will be hidden from the report author's view, for example when they use this data module to create a dashboard.
3. **Usage Type.** The icons next to the field names indicate the data type setting.
 - **# Numeric fields.** The hashtag icon next to an item indicates it's a numeric field used as an identifier.
 - **abc Alpha-numeric fields.** This icon next to an item indicates it's an alpha-numeric field used as an identifier or attribute.
 - **Location.** The pin icon indicates the field is a location dimension which may be used for geospatial mapping.
 - **Measures.** The ruler icon next to an item indicates it's a measure.
 - **Time.** The clock icon indicates the field is a time dimension.

4. Similar to the context menu options you saw earlier for tables, data items also have many options. Expand the **Loyalty Program Details and Measures** folder (if needed). Click the ellipsis icon to the right of **Unit Sale Price** and select **Format data...**



5. The **Data format** dialog opens. Click the down arrow next to **Format type**. Verify that the value is **Currency**. This setting was assigned automatically based on Cognos Analytics having recognized a data format previously set in the uploaded file. A list of additional formatting settings for currency are presented. Users are also able to assign a value for missing value characters.



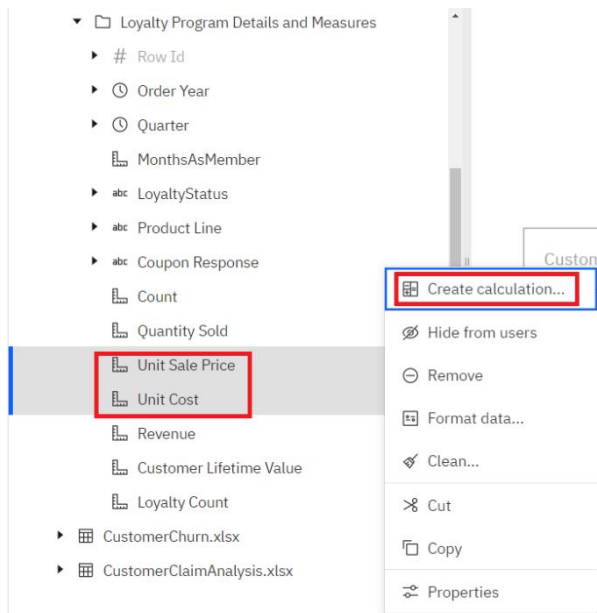
6. For this workshop, we will not make any changes to the currency settings. Click **Cancel**. This will maintain the default format of a leading currency symbol and two decimal places.

- __7. Repeat these steps to verify that **Unit Cost** and **Revenue** are also set to **Currency**.
- __8. **Save** the data module.

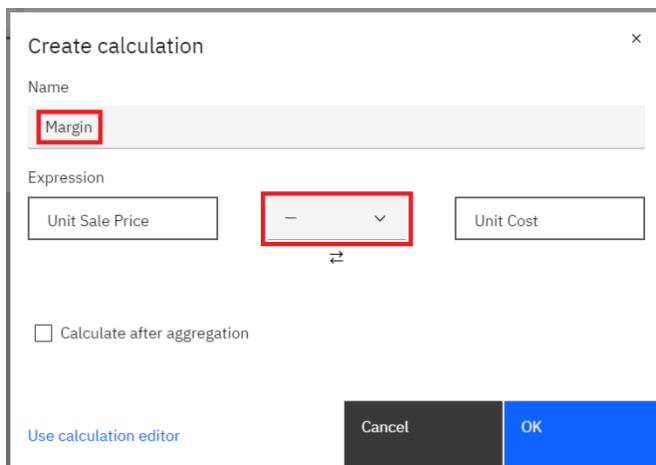
4.4 Create a Calculation

*Your data has Unit Sales Price and Unit Cost, but it would be helpful to have the margin calculated so it is available for analysis. By adding this calculation to the data module, it will be **reusable** anywhere in the analysis. Users will not need to rebuild the calculation themselves each time they need it in their dashboards, reports, etc.*

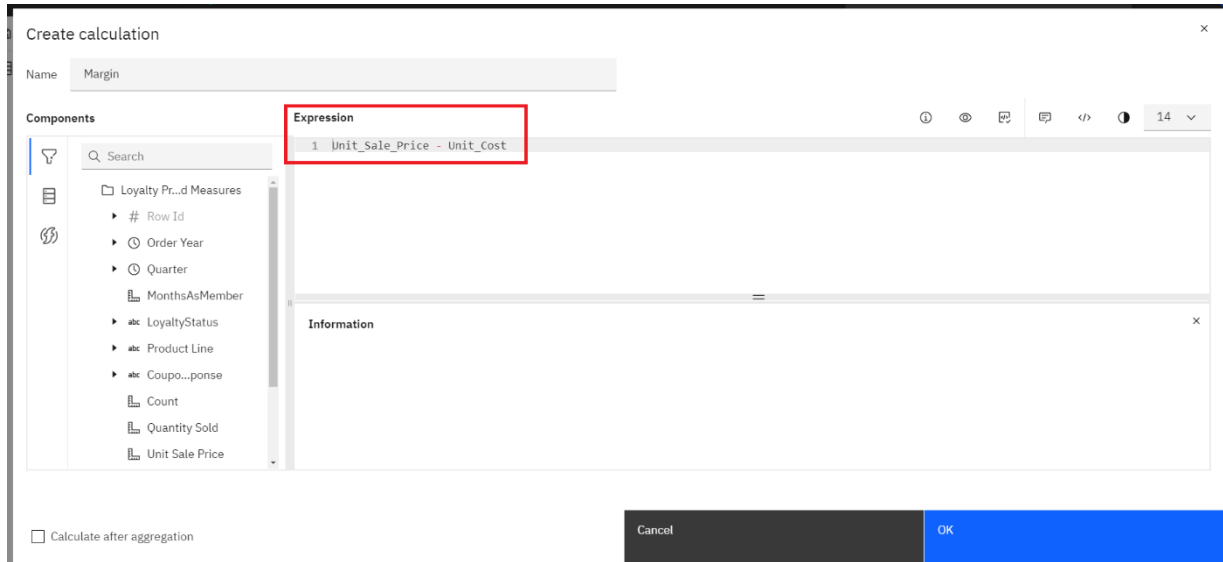
1. Cognos Analytics provides both simple and complex calculation capabilities. You will start with a simple calculation. In the **Loyalty Program Detail and Measures** folder, multi-select **Unit Sale Price** and **Unit Cost**. Right-click to bring up the context menu. Select **Create calculation...**



2. The **Create calculation** dialog appears. This dialog box allows the user to create a simple calculation. Users can select two fields and select from the basic operators for addition, subtraction, multiplication, division, percentage and percentage change calculations. Type **"Margin"** in the name textbox. Use the pull-down arrow to select the Subtraction operator.



- ___3. At this point, Cognos Analytics will create the underlying calculation. However, users can create more complex calculations using the Calculation Editor. Click **Use calculation editor** in the lower left corner to open the full calculation dialog box. You can now see the expression that Cognos Analytics created for you from the previous dialog box.



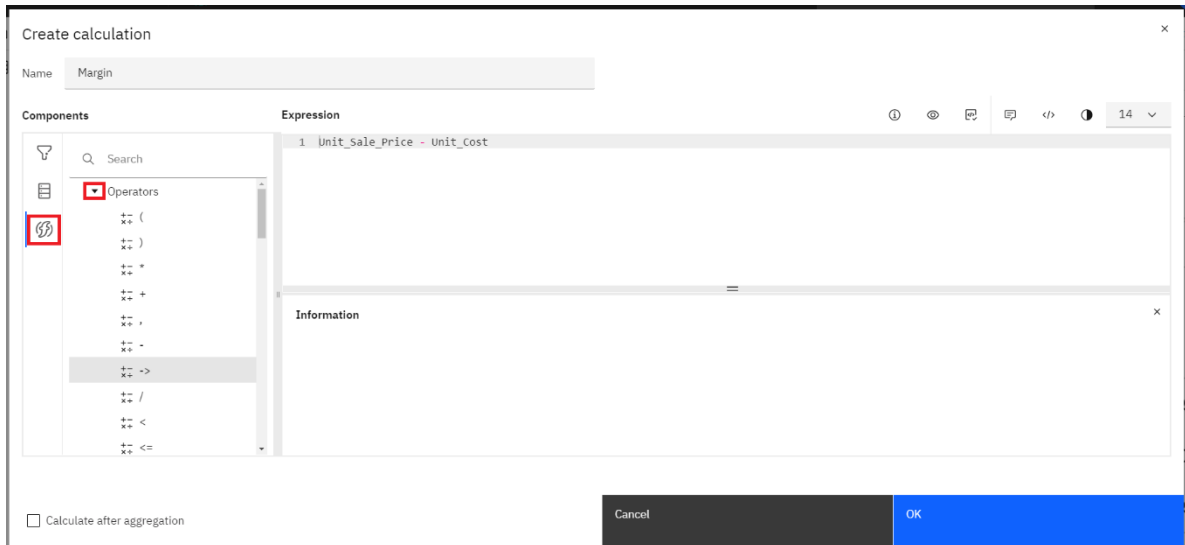
- ___4. The Calculation Editor provides many capabilities in a toolbar to make it easy for you to create, document, evaluate and test your expressions

- **Information**. Provides the user with additional context and assistance.
- **Preview**. Provides a sample rendering of the calculation results along with the Execution time to run. Click **Preview**. Results appear in the lower right window.
- **Validate**. Validation allows users to test their calculation to ensure no errors occur. Click **Validation**. Results appear in the lower right window.
- **Comment**. Allows users to insert comments within the calculation itself; to make notations throughout the expression. Click **Comment**. Notice that the calculation is greyed out and preceded with the familiar “//” used in SQL. Click **Comments again** to uncomment the calculation.
- **Prettify**. Restructures the calculation expression into a more readable format for users. E.g. When a CASE WHEN expression is in one long block of text that wraps across lines, Prettify will clean it up and break it out into shorter segments with each condition clause on a separate line.
- **High Contrast Mode**. This mode reverses the color scheme in the expression editor. This provides black background with light text some users prefer. Click **High**

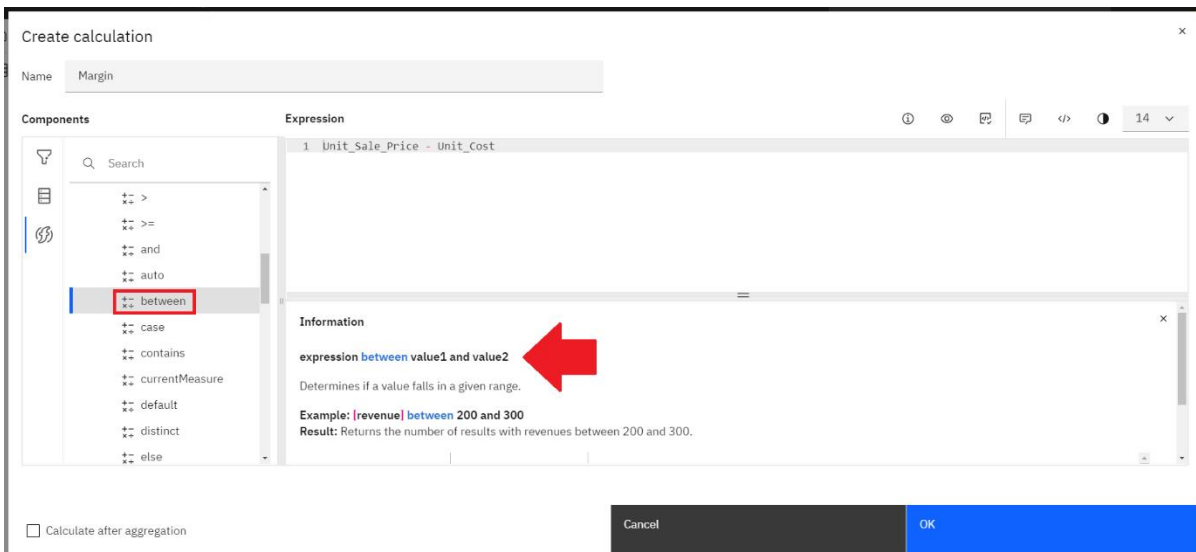
Contrast. Click **again** if you wish to restore the original background.

- **14** **Font.** The default font size for the expression editor is 14. Users may increase or decrease the font size used.

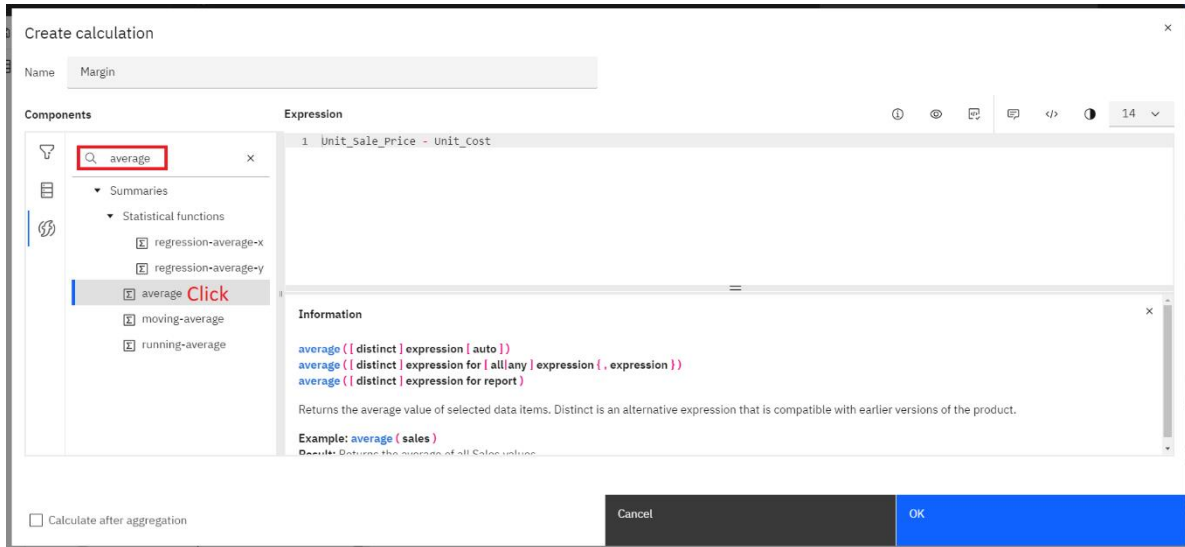
__5. Click the **Functions** tab on the far left navigation panel and click the **arrow** to expand **Operators**. Here, you are presented with the full scope of mathematical operators and commands to create complex calculations.



__6. Scroll through the list and select various operators. View the syntax for the operator in the bottom right window.

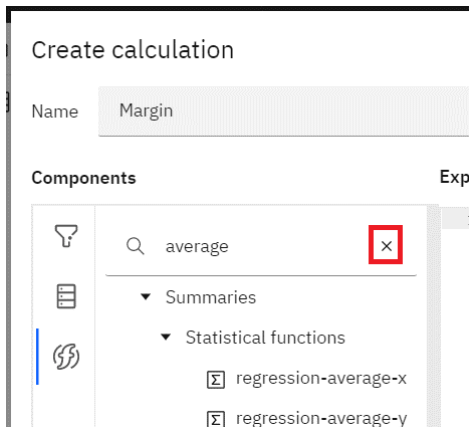


- __7. You can also use the **Search** to find functions. On the **Functions** tab, type “average” into the **Search** field. Click on **average** in the results list to view the function’s syntax.



For the purposes of this workshop, we will walk through manually creating the same calculation as Cognos Analytics created for you and is shown in the Expression field (Unit_Sale_Price - Unit_Cost) To do so, you will use a simple drag and drop method to bring over the data items and operators from the components panel. Users could also type their expressions directly in the Expression box, or use copy/paste.

- __8. Click on the **Clear** button (X) in the **Search** field to remove the search criteria.



- __9. In the **Expression** box, place your cursor at the end of the expression shown on line 1. Press **Enter** to bring your cursor to a new line, **line 2**. We will keep the expression on line 1 for reference and remove the duplicate expression at the end of the exercise.

Expression

```
1 Unit_Sale_Price - Unit_Cost
2
```

- __10. Open the **Data source** tab and expand the folder named **Loyalty Program Details and Measures**.

The screenshot shows two windows side-by-side. The left window, titled 'Components', has a search bar and a tree view. The tree view is expanded to show 'Loyalty Program ...ls and Measures', which is highlighted with a red box. Below it are sub-items: '# Row Id', 'Order Year', and 'Quarter'. The right window, titled 'Expression', shows two lines of text: '1 Unit_Sale_Price - Unit_Cost' and '2'.

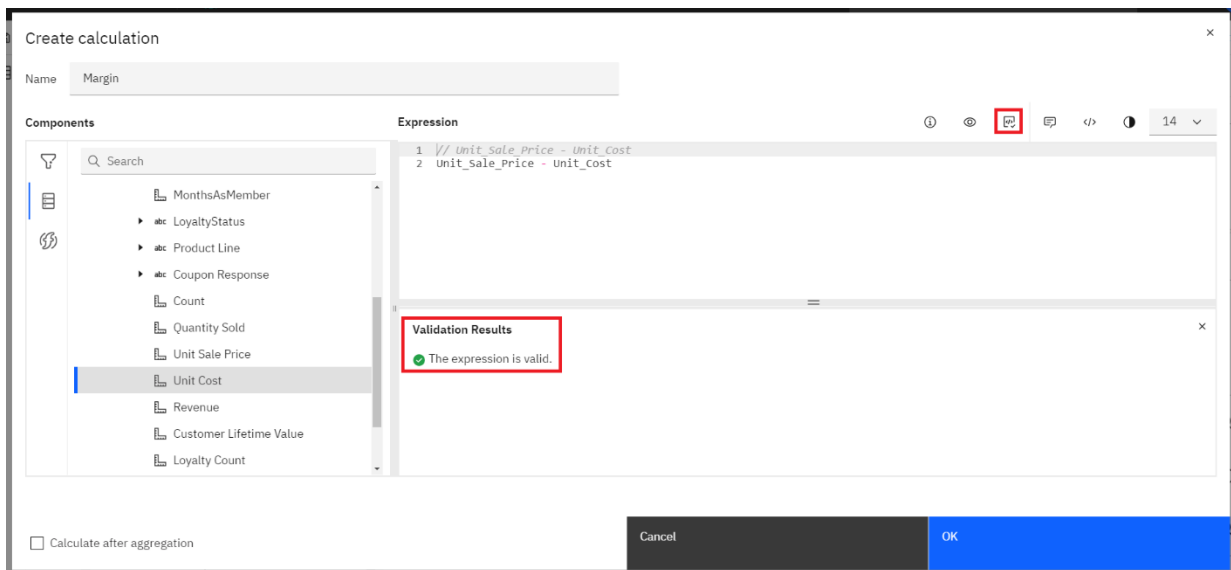
- __11. Click on **Unit Sale Price** and drag it to line 2 in the **Expression** window.

The screenshot shows the same two windows as in the previous step. In the 'Components' window, the 'Unit Sale Price' item is highlighted with a red box. A red arrow points from this item to the '2' line in the 'Expression' window. A blue button labeled 'Unit Sale Price' is also visible in the 'Expression' window.

- __12. Open the **Functions** tab and expand **Operators**. Drag the subtraction function to the right of **Unit Sale Price** in line 2.

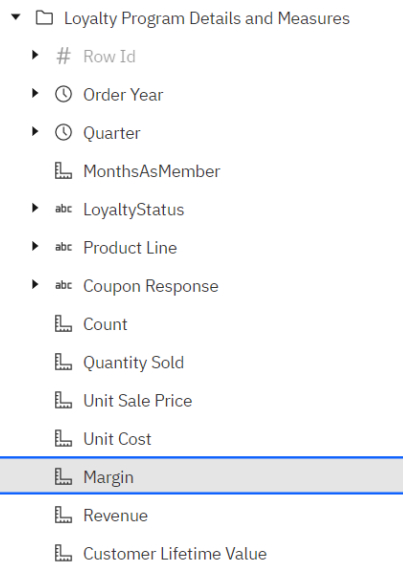


- __13. Return to the **Data Source** tab and drag **Unit Cost** after the subtraction operator to complete your calculation.
- __14. Click anywhere on the calculation expression in line 1 and click the **Comment** icon in the toolbar. This will comment out the entire line so you may now validate your new expression to ensure there are no errors in syntax.
- __15. Click the **Validate** icon in the toolbar. The validation results in the lower window should state **“The expression is valid.”**.



- __16. Click **OK** to return to your data module.

__17. The new expression is added to the top of the **Loyalty Program Details and Measures** folder. Drag **Margin** below **Unit Cost**.



__18. Now you want to apply the same currency format as you used for Revenue. Select **Margin**, right-click it to open the context menu, and select **Format data...**

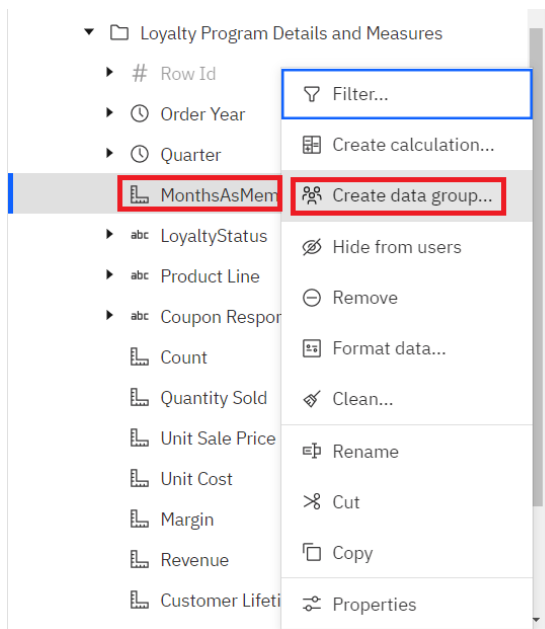
__19. In the **Data format** dialog, set the **Format type** to **Currency** and click **OK**.

__20. **Save** the data module.

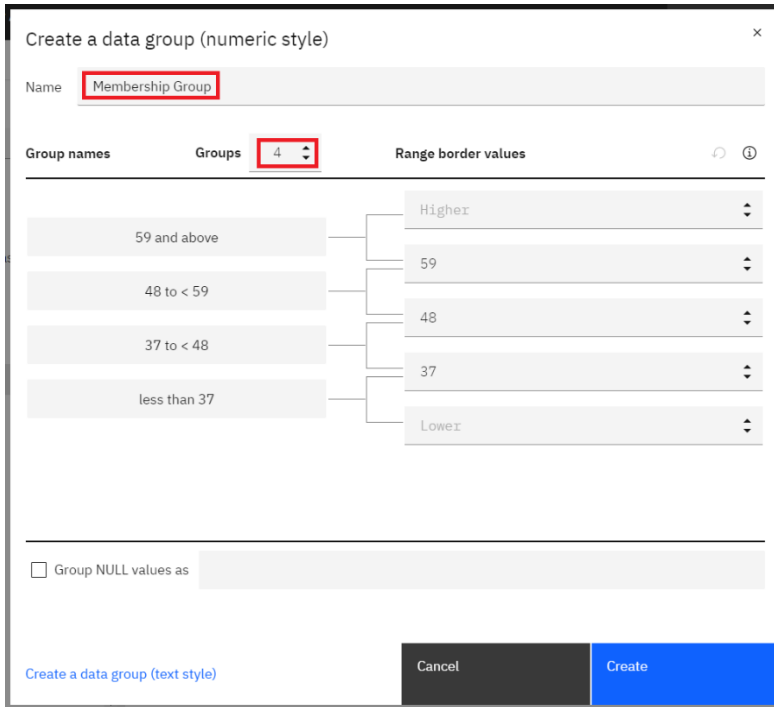
4.5 Create a Custom Data Group

Often, users need to organize data into groups for analysis, sometimes referred to as “binning” or “buckets”. In looking at **MonthsAsMember**, you feel that analyzing membership on each membership duration may not provide much insight. For instance, there may not be a great deal of difference between someone who has been a member for 15 versus 16 months. Rather, you would be more interested in the behaviors of members with similar membership durations. Therefore, you will create custom groupings to “bin/bucket” the individual membership duration into **MonthsAsMember** category groups.

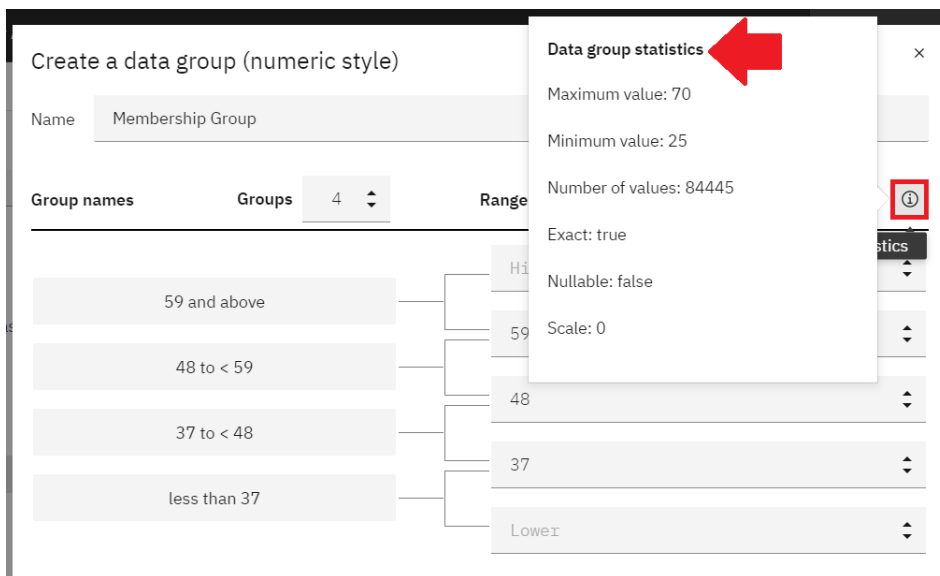
1. In the **Loyalty Program Details and Measures** folder, right-click the column **MonthsAsMember** and select **Create data group...**



__2. Type “Membership Group” in the **Name** textbox and set **Groups** to 4.



__3. Since **MonthsAsMember** is a numeric value, an equal distribution of month ranges will be automatically calculated. Cognos Analytics also provides you with statistics on your data such as min/max and number of values. Click the **Data group statistics** icon on the right side of the dialog.



__4. Click outside the window to close it.

- __5. You can override the default equal distribution to manually define your groups and customize the group names. The equal distribution is interesting and shows that the distribution is very close to full years. You want to update the groups to monthly cutoffs that correspond to full years for every group. Click directly in each of the **Range border values** fields and change the values to those shown below. Then, click directly in the **Group names** fields to change the names as follows:

Create a data group (numeric style) ×

Name

Group names Groups Range border values ↺ ?

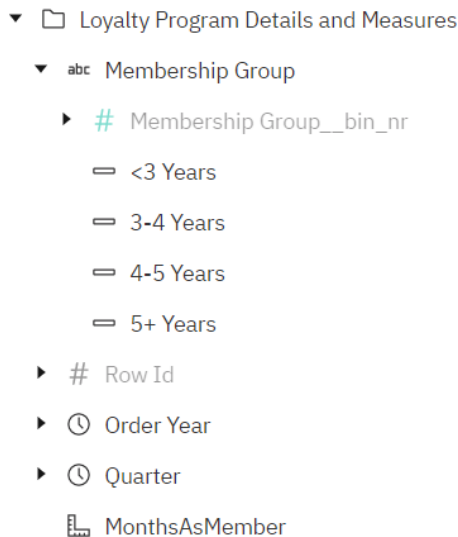
<input type="text" value="5+ Years"/>	<input type="text" value="Higher"/>
<input type="text" value="4-5 Years"/>	<input type="text" value="60"/>
<input type="text" value="3-4 Years"/>	<input type="text" value="48"/>
<input type="text" value="<3 Years"/>	<input type="text" value="36"/>
	<input type="text" value="Lower"/>

Group NULL values as

[Create a data group \(text style\)](#)

- __6. Click **Create**.

- ___7. The new data group named **Membership Group** appears in the **Loyalty Program Details and Measures** folder at the top of the list. Click the arrow next to **Membership Group** to expand it. You will now see the individual members you created, and a new column named **Membership Group__bin_nr**. This column is an identifier field that is used for sorting. By default, it is set to hidden and will be greyed out.

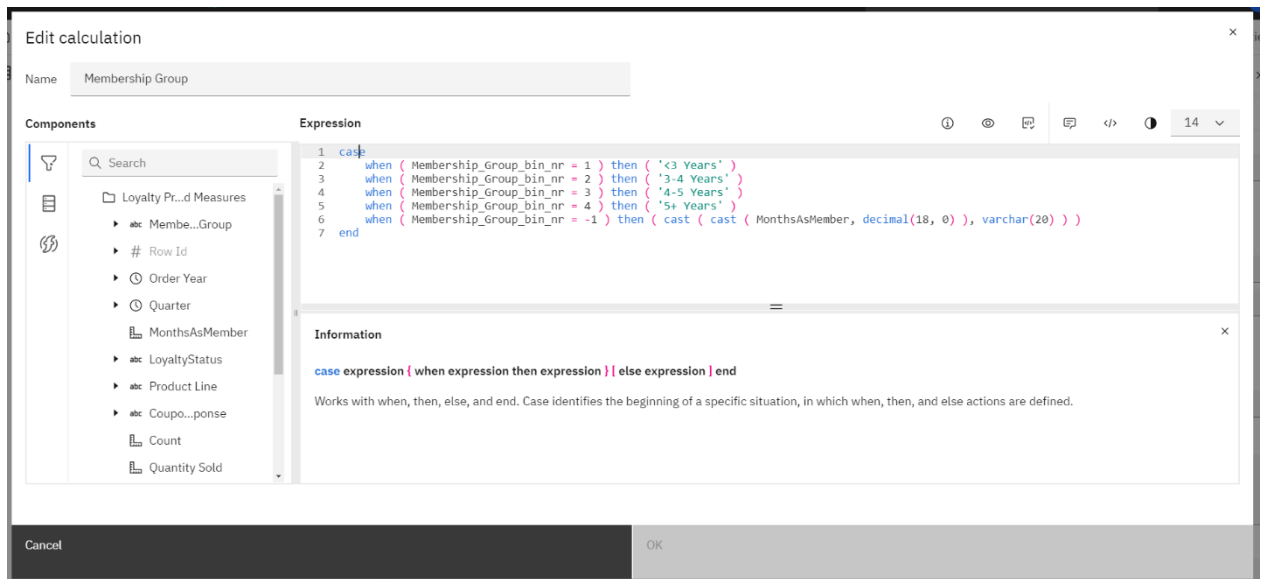


- ___8. Cognos Analytics created a complex calculation expression when creating the new membership group items. To see this calculation, right-click **Membership Group__bin_nr** and select **Properties**. On the **General** tab under the **Expression** property, click **View or edit** to open the **Edit calculation** dialog.

- ___9. When you created the data group, Cognos Analytics created a custom calculation in the form of a CASE statement, based on the **Range border values** you defined for the data group. Notice that the THEN statement uses the numeric values to support its use as a sort key. Click **Close**.



- ___10. With the **Properties** still open, click on the new **Membership Group** data item. Click on **View or edit** next to **Expression** to open the Edit calculation dialog again. Cognos Analytics created a custom calculation in the form of a CASE statement. For the Membership Group, it shows range values and the THEN statement uses the group names you defined.



- ___11. Click **Cancel** to close the calculation editor dialog.
- ___12. Close the **Properties** panel.
- ___13. **Save** the data module.

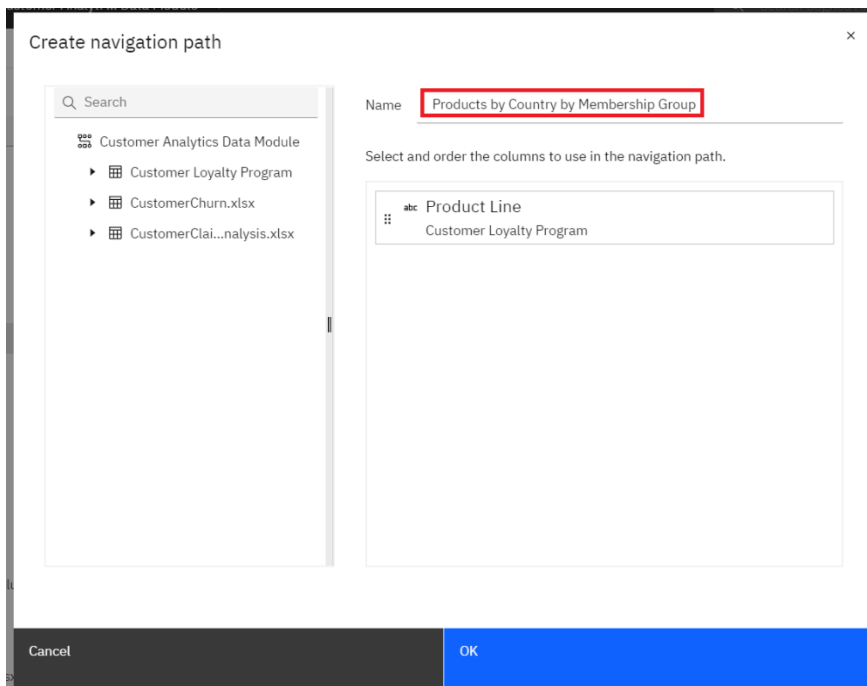
4.6 Create a Navigation Path

A navigation path is a collection of non-measure columns that business users leverage for data exploration. Navigation paths can now be defined in a data module or dashboard to help users easily explore and drill down to see their underlying data. These can be “natural” navigation paths that follow a defined hierarchy, or they can be defined to allow users to navigate and drill down in any order that makes sense for their analysis.

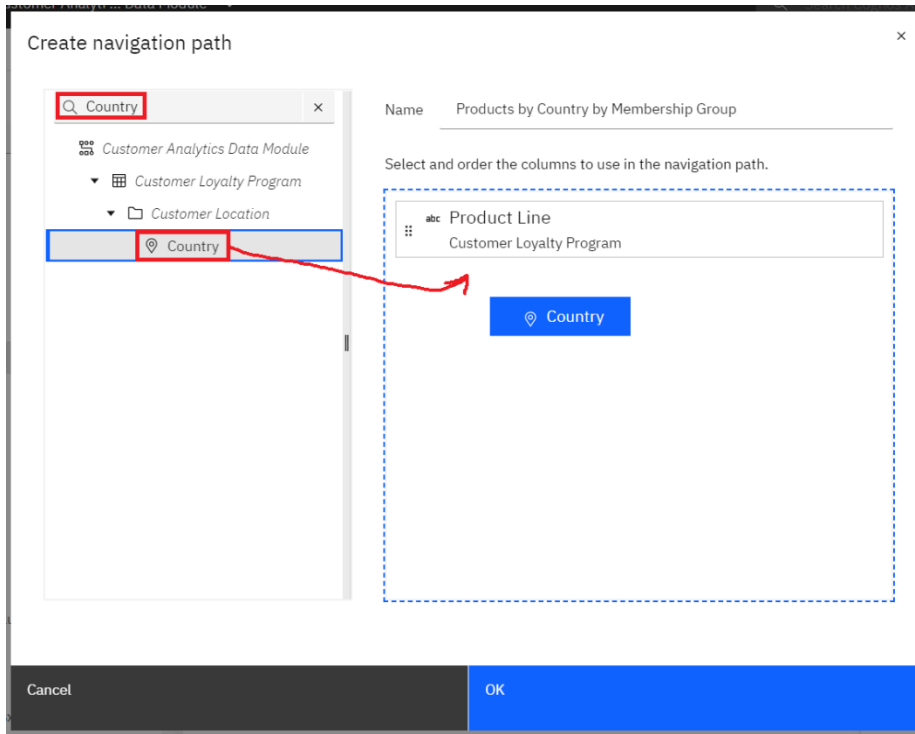
*In traditional BI and OLAP technologies, a drill down action requires a pre-defined hierarchical data structure so that you can navigate the drill down i.e. Year to Month to Day. **Navigation paths** are much more flexible and can accommodate a drill down path that aligns with the thought process users go through to analyze their business.*

For your analysis, you need to analyze Product Line performance by Country and MonthsAsMember groups, so you will create a navigation path that allows you to drill down in your data on that path.

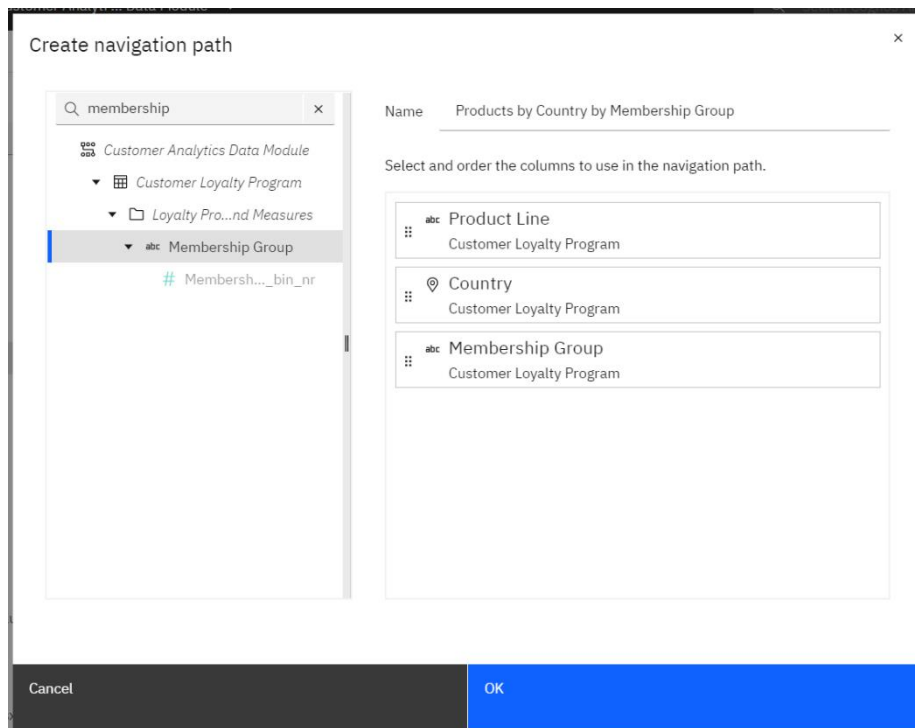
- __1. You are interested in analyzing Product Line performance by Country and Membership Group.
- __2. From the **Loyalty Program Details and Measures** folder, right-click **Product Line** and select **Create navigation path...**
- __3. Type “*Products by Country by Membership Group*” in the **Name** textbox.



4. In the **Search** textbox, type “Country”. Click and drag **Country** under **Product Line**.



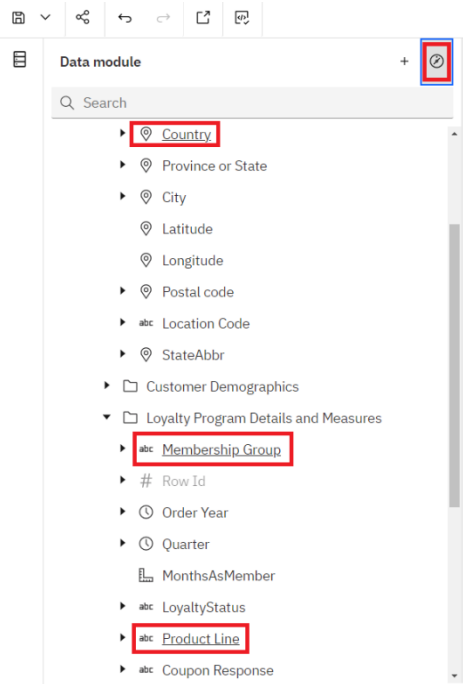
5. In the **Search** textbox, type “Membership”. Click and drag **Membership Group** under **Country**. Your navigation path should now appear as follows:



6. Click **OK**.

The same column may be added to multiple navigation groups.

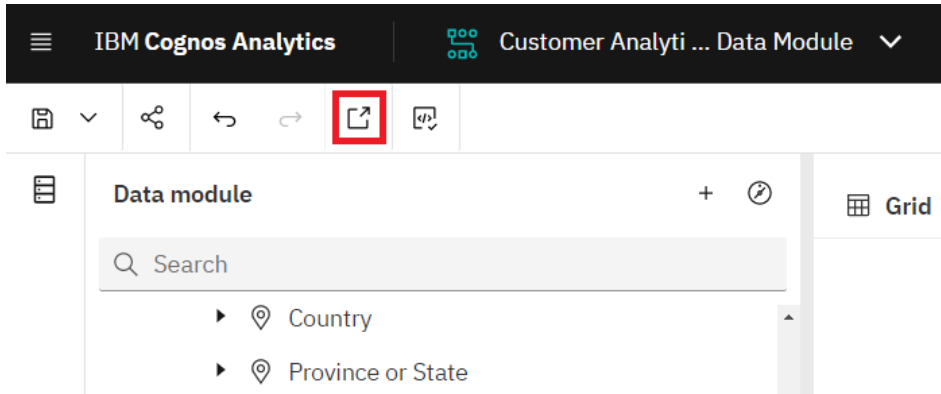
- __7. To identify your navigation path members in the **Data module** panel, click the **Identify navigation path members** icon at the top right corner of the Data Module panel. Each data item used in a navigation group is now underlined to identify its membership.



- __8. **Save** the data module.

5 Testing the Data Module

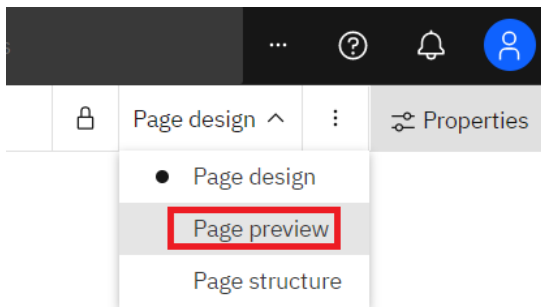
1. Now that you have your data module, it's time to test it out before creating new content for your analysis. Click on the **Try this data module in Reporting** icon in the main toolbar.



2. Cognos Analytics will open a new browser tab that will allow for the creation of a list report to validate the data module.

If a new browser tab is not created, be aware of pop-up blockers in your browser. If they are enabled, you will need to allow pop-ups for this server.

3. To begin, you'll put the report in preview mode so that you can see the data update as you test the data module. Click the down arrow beside the **Change page editor** widget and select **Page preview**.



4. To easily build a report and test your data module, you can select a few items from the **Insertable objects** pane and drag them onto the report's canvas. Click on the arrow next to **Customer Loyalty Program** to expand it, then expand the **Loyalty Program Details and Measures** folder.

__5. Double-click **Membership Group** to add it to the List.

The screenshot shows the IBM Cognos Analytics interface. The top navigation bar includes the IBM Cognos Analytics logo, a 'New report' dropdown, and a search icon. Below the navigation bar, there are navigation arrows and the breadcrumb 'Report > Pages > Page1'. The main area is divided into two panes. The left pane, titled 'Insertable objects', contains a search bar and a tree view of data modules. The right pane shows a table with one column, 'Membership Group', and five rows of values: '<3 Years', '3-4 Years', '4-5 Years', and '5+ Years'. A 'Double-click to edit text' prompt is visible above the table.

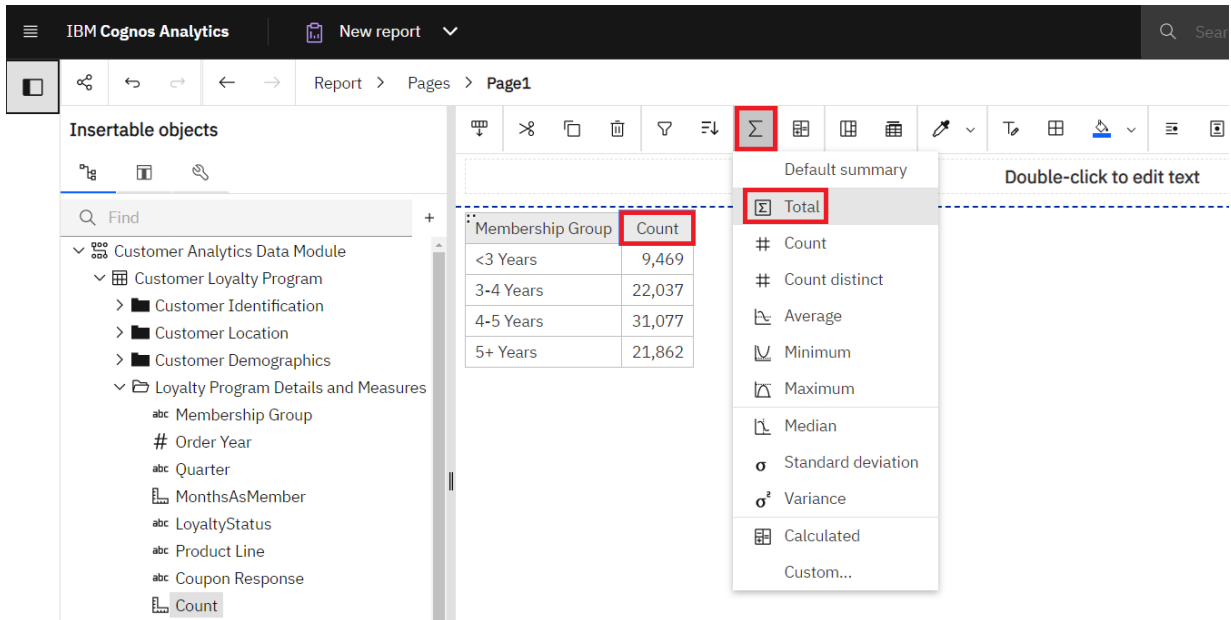
Membership Group
<3 Years
3-4 Years
4-5 Years
5+ Years

__6. Double-click **Count** to add it to the List.

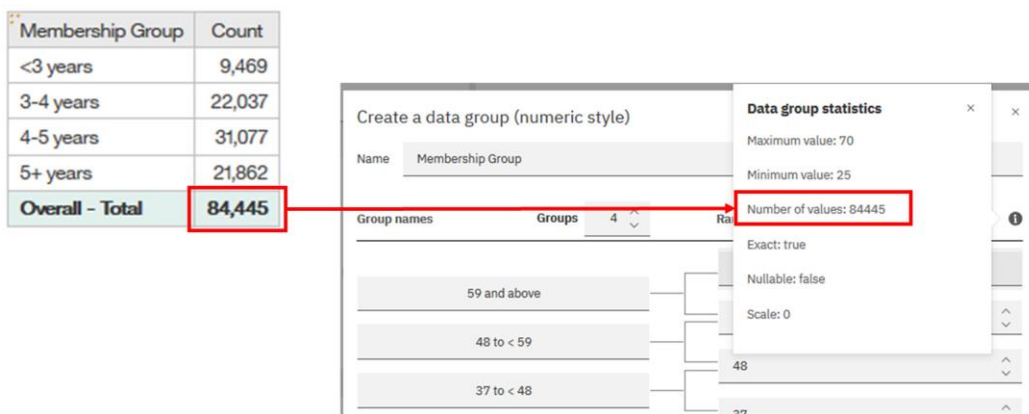
The screenshot shows the IBM Cognos Analytics interface. The top navigation bar includes the IBM Cognos Analytics logo, a 'New report' dropdown, and a search icon. Below the navigation bar, there are navigation arrows and the breadcrumb 'Report > Pages > Page1'. The main area is divided into two panes. The left pane, titled 'Insertable objects', contains a search bar and a tree view of data modules. The right pane shows a table with two columns: 'Membership Group' and 'Count'. The table has five rows of data. A 'Double-click to edit text' prompt is visible above the table.

Membership Group	Count
<3 Years	9,469
3-4 Years	22,037
4-5 Years	31,077
5+ Years	21,862

7. Counts are brought in for each of the Membership Groups you defined. Click on the header for the **Count** column to select it. Click on the **Summarize** icon in the context toolbar to open the summary options for the column. Select **Total**.



8. Notice the **Overall-Total** count matches what you saw earlier in the workshop as the **“Number of Values”** under **Data group statistics** when you created the custom data group. You’ll use this count to verify your data module is consistent for reporting as you look at other ways to “slice and dice” your data.



9. In the List, click on the **Membership Group** header. Click **Delete** on your keyboard. The column is removed from the List, leaving only **Count**, where you see the total has remained the same.

Count
84,445
84,445

__10. From the **Insertable objects** panel, click on **Product Line** and drag it onto the List to the left of **Count**, dropping it when the vertical bars indicate the **drop zone**.

__11. The **Count** should remain the same. If this is true, the module is behaving as expected.

Product Line	Count
Photography	14,956
Computers and Home Office	19,726
Smart Electronics	8,323
TV and Video Gaming	33,874
Kitchen Appliances	7,566
	84,445

__12. Next, you want to also verify that the data module is performing with the other files you brought in for your analysis and joined together. Expand the **Customer Demographics** folder. Drag **Education** between **Product Line** and **Count**.

__13. The report updates with the Education column, and the Total remains, verifying that the relationship join you created is working as intended.

Product Line	Education	Count
Computers and Home Office	Bachelor	12,189
Computers and Home Office	College	5,041
TV and Video Gaming	High School or Below	1,586
Photography	Bachelor	9,397
TV and Video Gaming	Doctor	1,458
Kitchen Appliances	Doctor	366
Computers and Home Office	High School or Below	970
Photography	High School or Below	739
Kitchen Appliances	Master	224
Smart Electronics	Bachelor	5,201
TV and Video Gaming	Bachelor	21,204
Computers and Home Office	Doctor	911
Computers and Home Office	Master	615
Kitchen Appliances	Bachelor	4,722
Photography	Master	436
TV and Video Gaming	College	8,612
Kitchen Appliances	College	1,911
Smart Electronics	Master	304

↑ Top ↑ Page up ↓ Page down ↓ Bottom

- __14. Your quick test confirms the setup is correct and the data module is behaving as expected.
- __15. Close the test **New Report** tab in the browser to return to the data module.
- __16. **Save** the data module.

Congratulations! You've completed your first data module and tested it. Your data module may be used as the source for your future Dashboards, Reports, Explorations, and Stories.

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