

Getting Started with Power BI Desktop



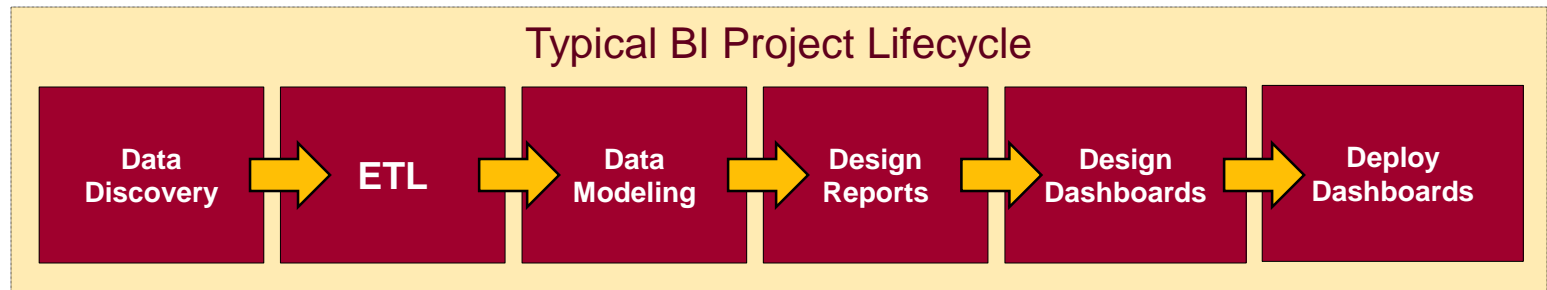
Agenda

- Getting Started with Power BI Desktop
- Creating Queries in Power BI Desktop
- Modeling Data in Power BI Desktop
- Designing Reports in Power BI Desktop
- Publishing Power BI Desktop Projects
- Understanding Parameters and Template Files



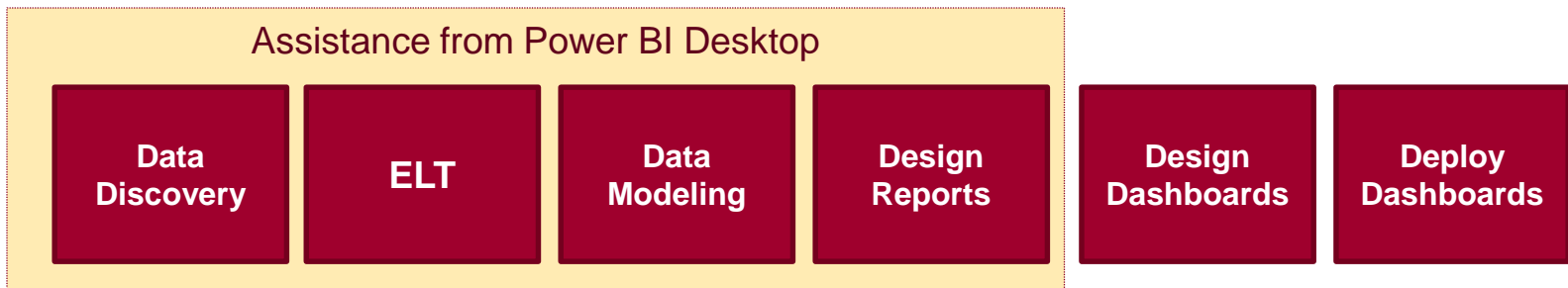
Project Lifecycle for a Custom BI Solution

- Lifecycle of a typical BI project includes...
 - Discover where the data lives
 - Extract, transform and load (ETL) data
 - Model data to create dataset for analytics and reporting
 - Design and implement reports on top of dataset
 - Consolidate reports into one or more dashboards
 - Package project artifacts for deployment
 - Deploy to production environment



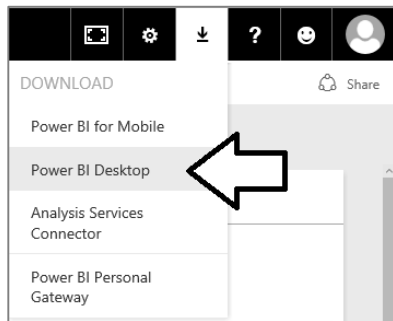
Working with Power BI Desktop

- Power BI Desktop focuses on first four phases
 - Query features for Data Discovery
 - Query features for ETL
 - Design features and DAX language for data modeling
 - Report design using a visual report designer
 - No support for designing dashboards
 - No support for packaging an entire solution



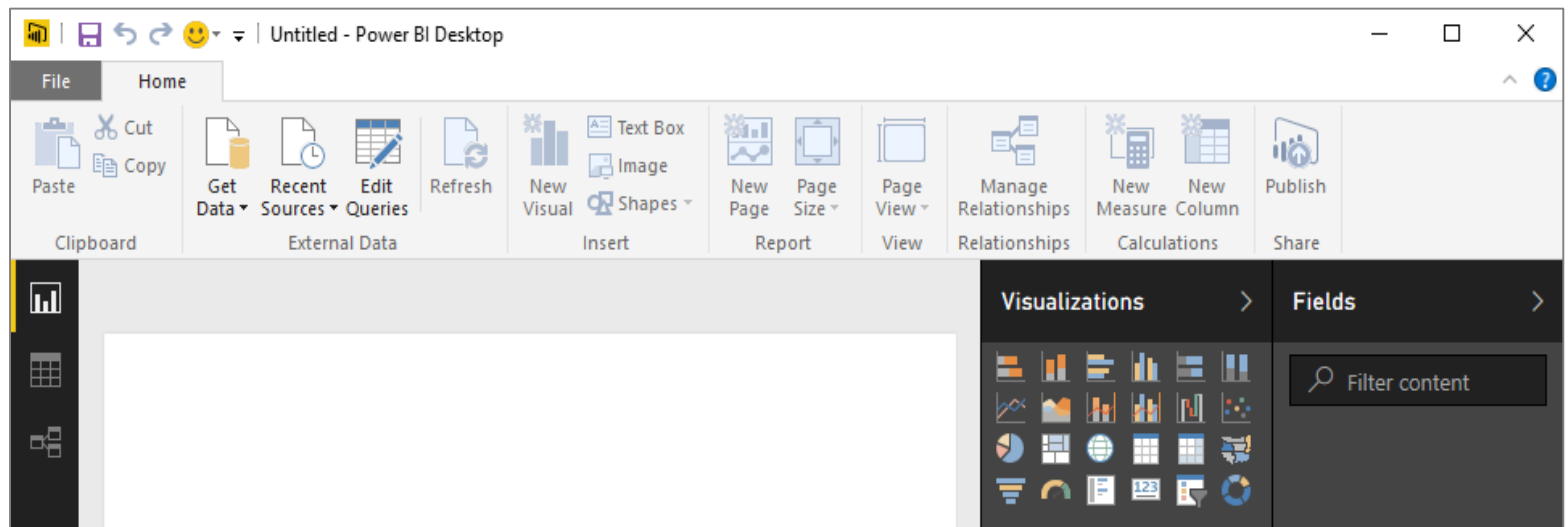
Installing Power BI Desktop

- Power BI Desktop quick & easy to install over the Internet
 - Select Power BI Desktop option from Power BI Download menu
 - Power BI Desktop downloads & installs in less than a minute



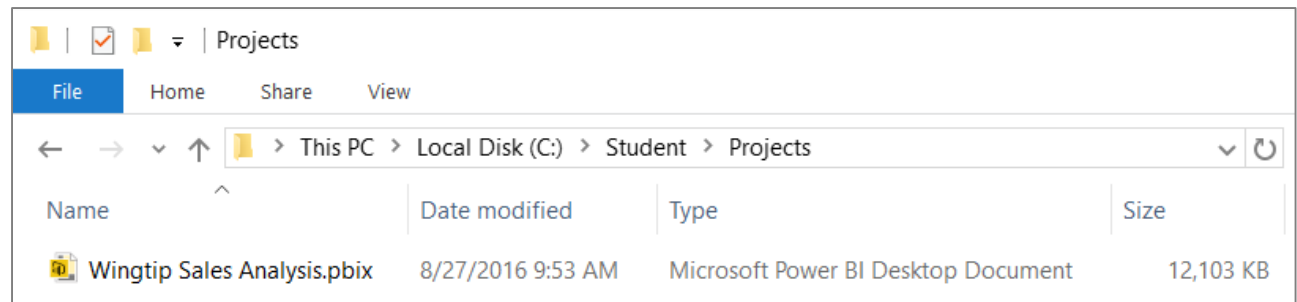
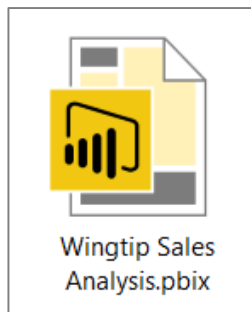
Working with Power BI Desktop

- Power BI Desktop is a Windows application
 - Work is saved and published in terms of projects
 - You can work on multiple projects at once
 - Each project runs in its own Power BI Desktop instance
 - Power BI Desktop can freeze up or act buggy
 - Quit & restart Power BI Desktop if it acts strangely



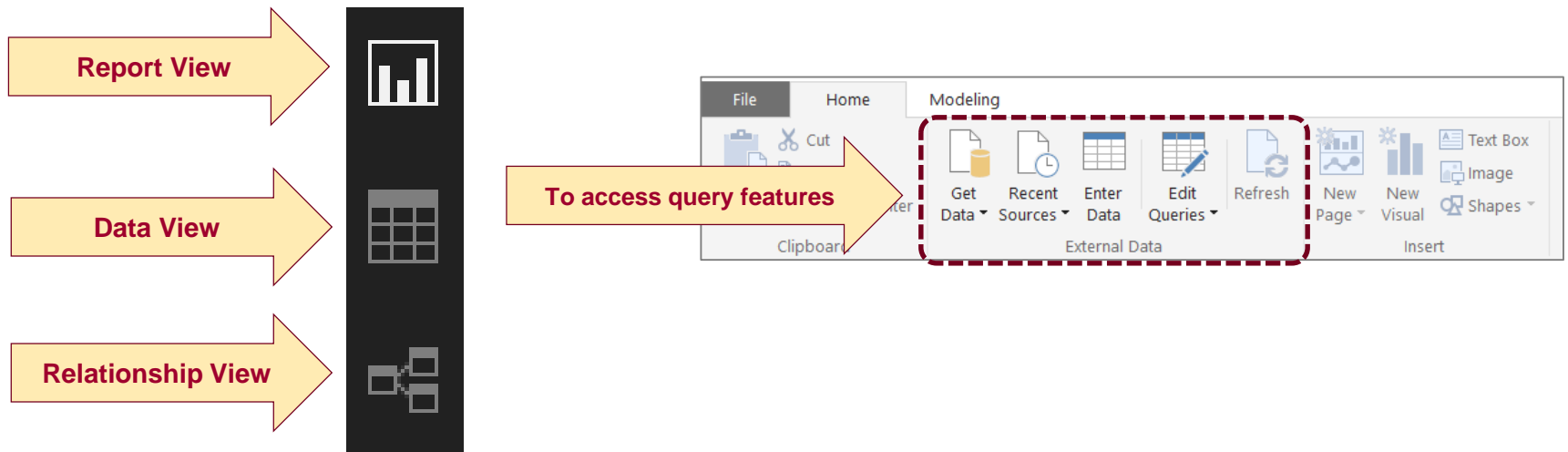
Projects and PBIX Files

- Power BI Desktop projects saved using PBIX files
 - PBIX file contains data source definitions
 - PBIX file contains query definitions
 - PBIX file contains data imported from queries
 - PBIX file contains exactly one data model definition
 - PBIX file contains exactly one report
 - PBIX file never contains data source credentials



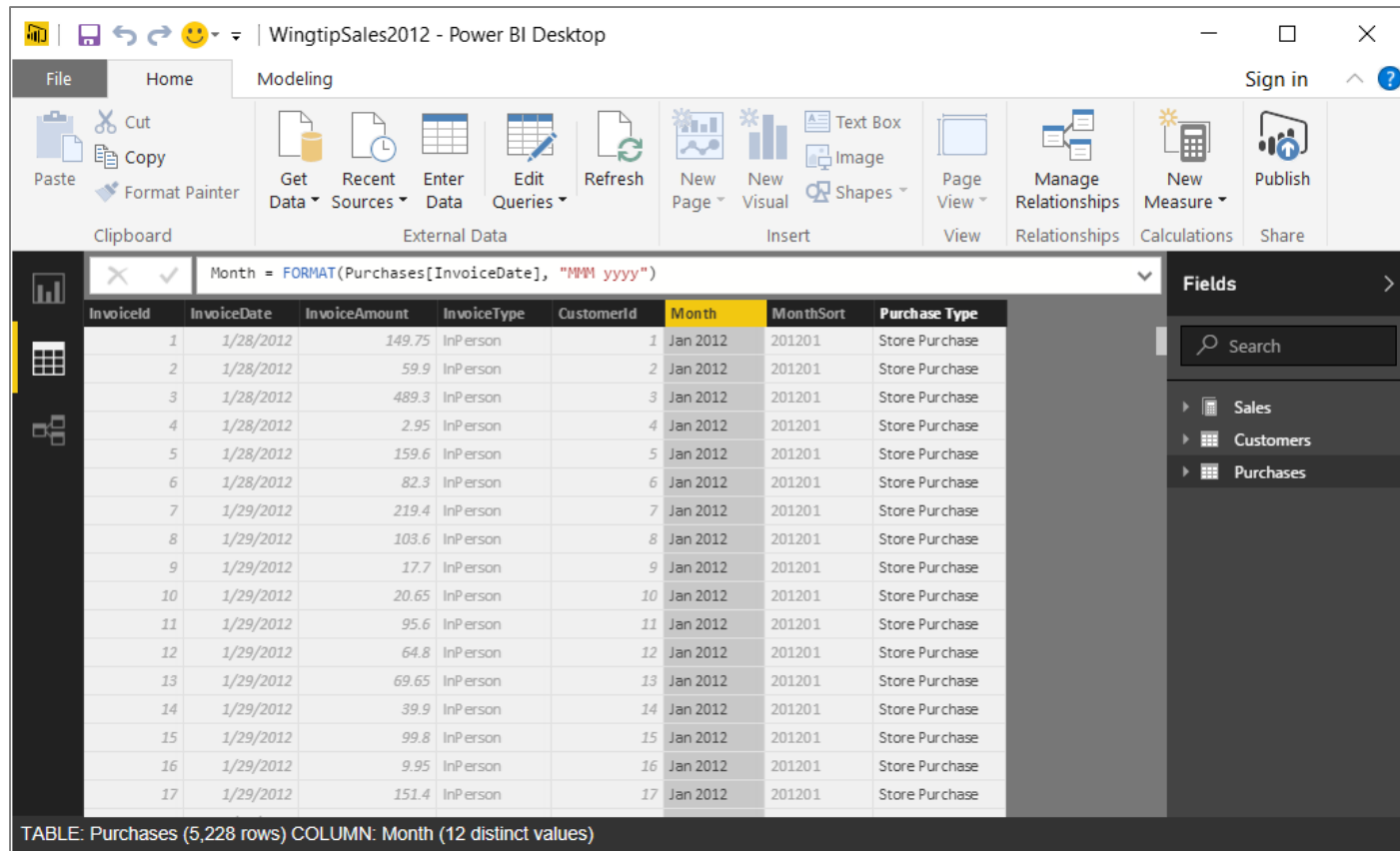
Getting Around in Power BI Desktop

- What do you need to learn to use Power BI Desktop?
 - Query features for importing data
 - Design features for modeling data
 - Report designer for creating reports
- Navigating between view modes



Data View

- Data view is used for data modeling
 - Data View displays columns and rows of data for each table
 - Data View used to create calculated columns and measures



WingtipSales2012 - Power BI Desktop

File Home Modeling Sign in

Paste Cut Copy Paste Format Painter Get Data Recent Enter Data Edit Queries Refresh New Page New Visual Text Box Image Shapes Page View Manage Relationships New Measure Publish

Clipboard External Data Insert View Relationships Calculations Share

Month = `FORMAT(Purchases[InvoiceDate], "MMM yyyy")`

InvoiceId	InvoiceDate	InvoiceAmount	InvoiceType	CustomerId	Month	MonthSort	Purchase Type
1	1/28/2012	149.75	InPerson		1 Jan 2012	201201	Store Purchase
2	1/28/2012	59.9	InPerson		2 Jan 2012	201201	Store Purchase
3	1/28/2012	489.3	InPerson		3 Jan 2012	201201	Store Purchase
4	1/28/2012	2.95	InPerson		4 Jan 2012	201201	Store Purchase
5	1/28/2012	159.6	InPerson		5 Jan 2012	201201	Store Purchase
6	1/28/2012	82.3	InPerson		6 Jan 2012	201201	Store Purchase
7	1/29/2012	219.4	InPerson		7 Jan 2012	201201	Store Purchase
8	1/29/2012	103.6	InPerson		8 Jan 2012	201201	Store Purchase
9	1/29/2012	17.7	InPerson		9 Jan 2012	201201	Store Purchase
10	1/29/2012	20.65	InPerson		10 Jan 2012	201201	Store Purchase
11	1/29/2012	95.6	InPerson		11 Jan 2012	201201	Store Purchase
12	1/29/2012	64.8	InPerson		12 Jan 2012	201201	Store Purchase
13	1/29/2012	69.65	InPerson		13 Jan 2012	201201	Store Purchase
14	1/29/2012	39.9	InPerson		14 Jan 2012	201201	Store Purchase
15	1/29/2012	99.8	InPerson		15 Jan 2012	201201	Store Purchase
16	1/29/2012	9.95	InPerson		16 Jan 2012	201201	Store Purchase
17	1/29/2012	151.4	InPerson		17 Jan 2012	201201	Store Purchase

Fields

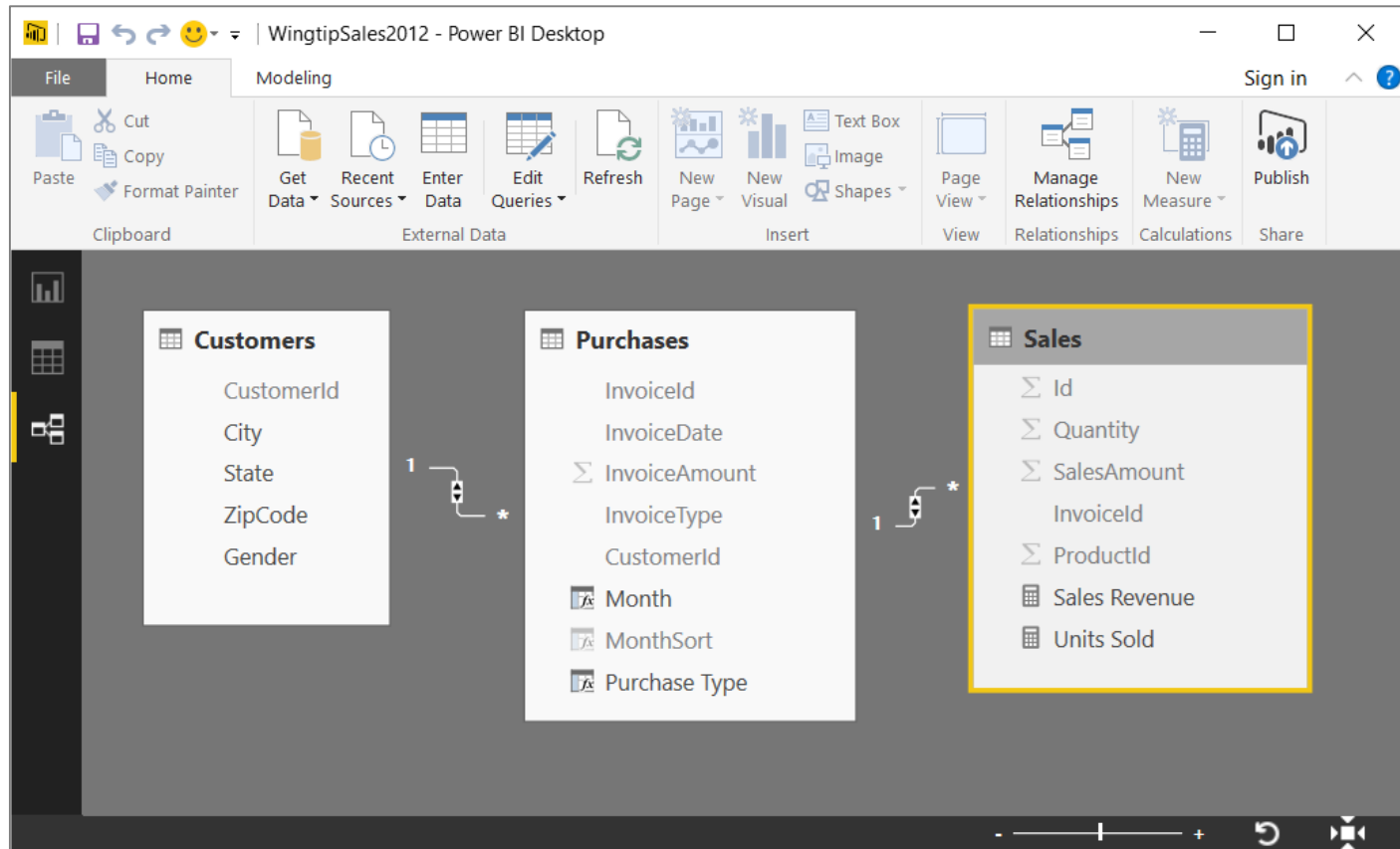
Search

Sales Customers Purchases

TABLE: Purchases (5,228 rows) COLUMN: Month (12 distinct values)

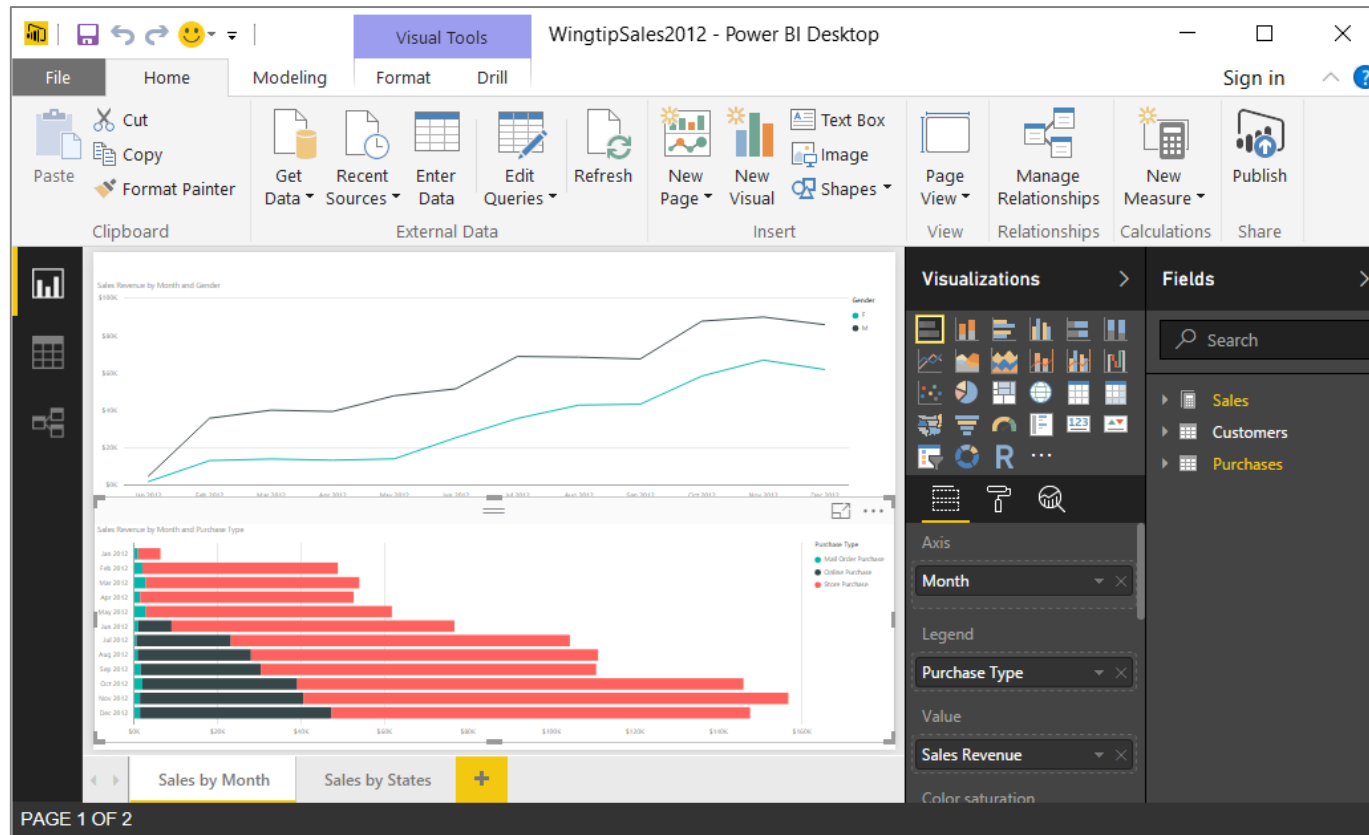
Relationship View

- Displays tables, fields and relationships
 - Used to view tables, fields and relationships in project's dataset
 - Used to create relationships when importing new tables



Report View

- Report view used to design report for current project
 - Report designer is very similar to Power BI service
 - Dataset can be simplified for Report View by hiding fields





DEMO

Getting Up and Running with Power BI Desktop

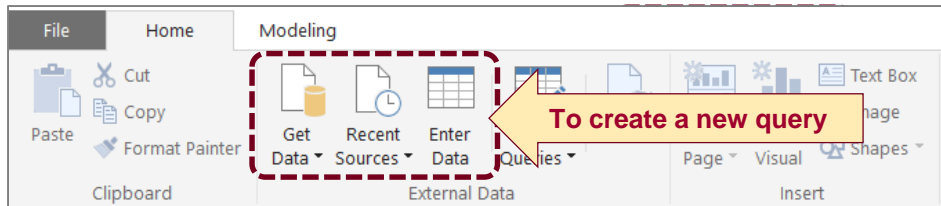
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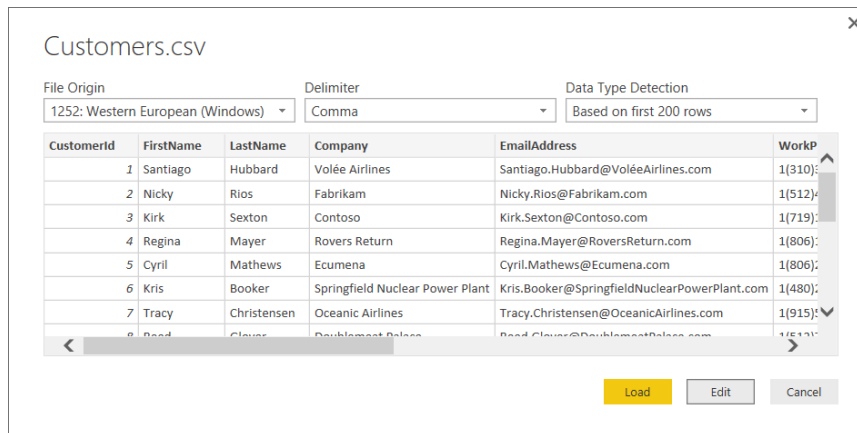


Creating Queries

- Power BI Desktop provides powerful query features
 - Get started by creating a new query



- The difference between Load versus Edit
 - **Load** command creates and execute new query without editing query
 - **Edit** command creates new query & opens it in Query Editor window



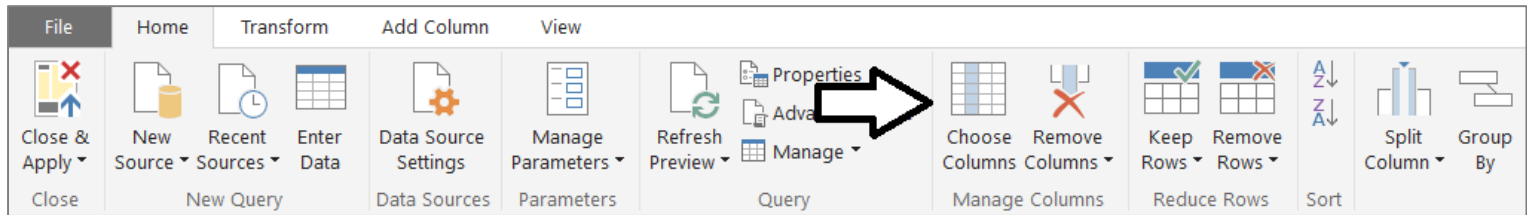
Query Editor Window

- Power BI Desktop provides separate Query Editor window
 - Provides powerful features for designing queries
 - Displays list of all queries in project on the left
 - Displays **Properties** and **Applied Steps** for selected query on right
 - Preview of table generated by query output shown in the middle
 - Query can be executed using **Apply** or **Close & Apply** command

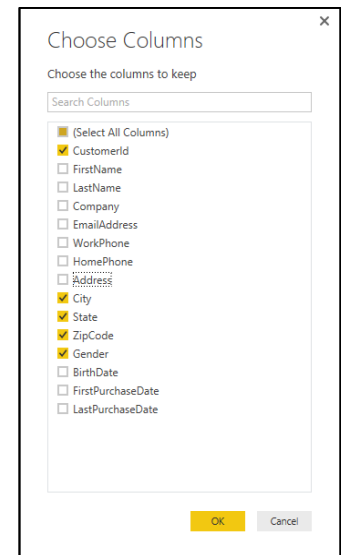
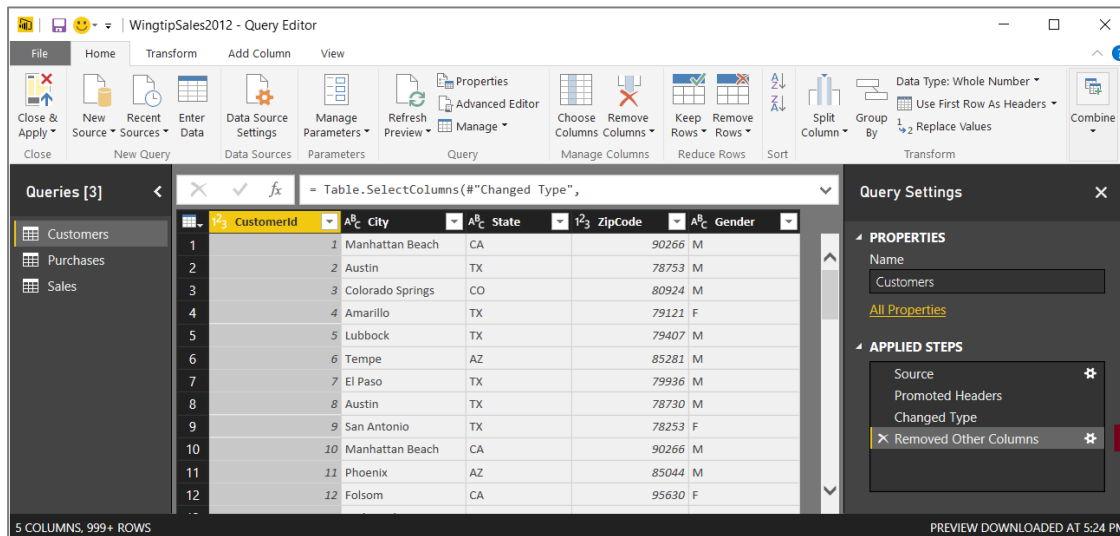


Queries Are Defined as Sequence of Steps

- Here is an example of adding a query step
 - Click a column header then click **Choose Column** button in ribbon



- Query definition is modified by adding new step





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Designing Queries to Import Data

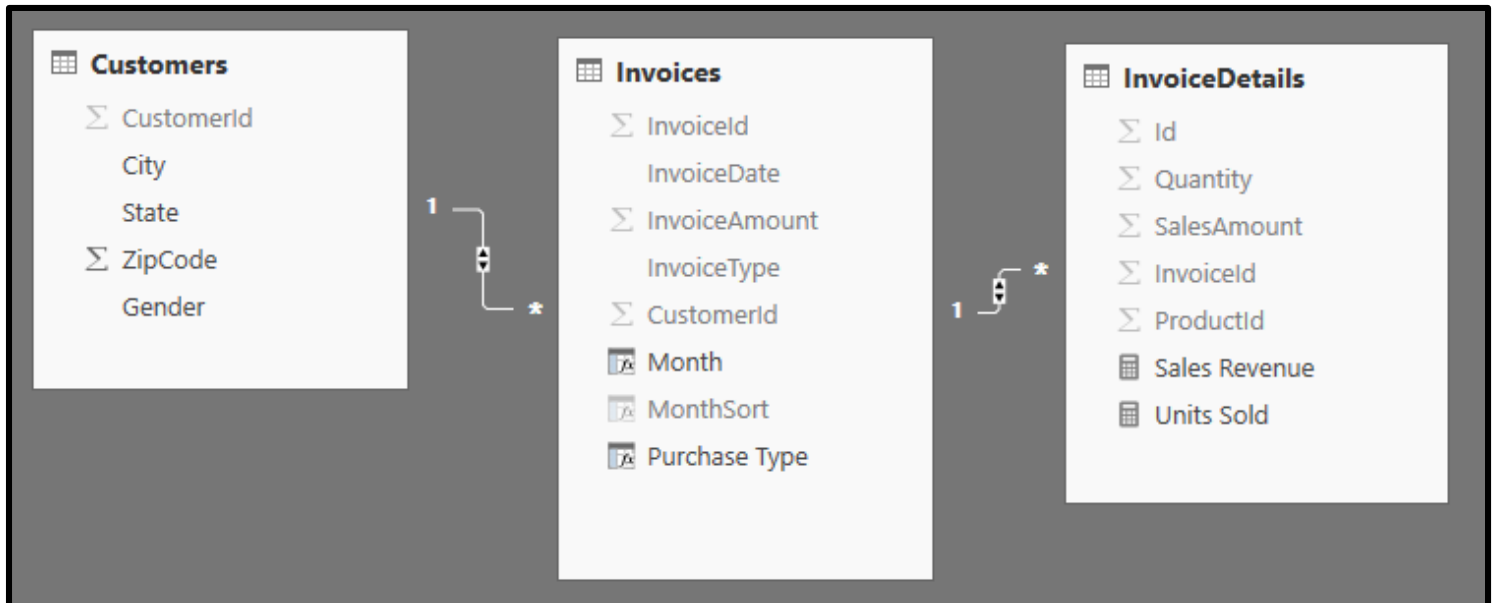
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The Project's Data Model

- Each PBIX project defines a data model
 - Data model contains tables, fields and relationships
- Tables contain three different types of fields
 - Native columns
 - Calculated columns
 - Measures



Data Analysis eXpression Language (DAX)

- Calculated columns and measures created using DAX
 - DAX is programming language used by tabular database model
 - Calculated columns and measures created with DAX Expressions

```
=SUM('Sales'[SalesAmount])
```

- DAX expressions are similar to Excel formulas
 - They always start with an equal sign (=)
 - DAX provides many built-in functions just like to Excel
- DAX Expressions are not the same as Excel formulas...
 - DAX expressions cannot reference cells (e.g. A1 or C4)
 - Instead DAX expressions reference columns and tables



Creating Calculated Columns

- Calculated column can be added to table
 - Calculated column created by clicking **New Column** button
 - Calculated column created as named DAX expression
 - DAX expression for calculate column evaluated at table load time

The screenshot displays the Microsoft Power BI Desktop interface. The 'Modeling' tab is active in the ribbon, showing the 'New Column' button highlighted with a yellow arrow. Below the ribbon, the DAX formula bar contains the following expression:

```
Purchase Type =  
SWITCH(Purchases[InvoiceType],  
    "InPerson", "Store Purchase",  
    "MailOrder", "Mail Order Purchase",  
    "Online", "Online Purchase"  
)
```

The main view shows a data table with the following columns: InvoiceId, InvoiceDate, InvoiceAmount, InvoiceType, CustomerId, Month, MonthSort, and Purchase Type. The 'Purchase Type' column is highlighted in yellow, and a yellow arrow points to it from the right. The 'Fields' pane on the right shows the 'Purchases' table expanded, with 'Purchase Type' selected. The status bar at the bottom indicates: 'TABLE: Purchases (5,228 rows) COLUMN: Purchase Type (3 distinct values)'.

InvoiceId	InvoiceDate	InvoiceAmount	InvoiceType	CustomerId	Month	MonthSort	Purchase Type
1	1/28/2012	149.75	InPerson		1 Jan 2012	201201	Store Purchase
2	1/28/2012	59.9	InPerson		2 Jan 2012	201201	Store Purchase
3	1/28/2012	489.3	InPerson		3 Jan 2012	201201	Store Purchase
4	1/28/2012	2.95	InPerson		4 Jan 2012	201201	Store Purchase
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9	1/29/2012	17.7	InPerson		9 Jan 2012	201201	Store Purchase
10	1/29/2012	20.65	InPerson		10 Jan 2012	201201	Store Purchase

Creating Measures

- Measure defined as named DAX expression
 - Measure created by clicking **New Measure** button in ribbon
 - Measure expression is evaluated at query time

The screenshot shows the Power BI Desktop interface with the 'Modeling' ribbon selected. A yellow arrow points to the 'New Measure' button in the 'Calculations' group. The formula bar at the top displays the DAX expression: `Sales Revenue = Sum(Sales[SalesAmount])`. Below the formula bar, a table of data is visible with columns: Id, Quantity, SalesAmount, InvoiceId, and ProductId. On the right side, the 'Fields' pane is open, and a yellow arrow points to the 'Sales Revenue' measure, which is highlighted with a yellow border. The 'Sales' table is expanded in the Fields pane, showing its columns and measures.

WingtipSales2012 - Power BI Desktop

File Home Modeling

Relationships Calculations Sort Formatting Properties Security

New Measure New Column New Table Sort By Column

Data Type: Format: \$ English (United States) \$ - % .00 2

Home Table: Sales Data Category: Uncategorized Default Summarization: Do Not Summarize

Sign in Manage Roles View As Roles

Sales Revenue = Sum(Sales[SalesAmount])

Id	Quantity	SalesAmount	InvoiceId	ProductId
46	5	99.75	28	6
81	5	99.75	44	6
194	5	99.75	109	6
487	5	99.75	258	6
581	5	99.75	307	6
601	5	99.75	317	6
641	5	99.75	337	6
657	5	99.75	344	6
738	5	99.75	382	6
756	5	99.75	391	6
858	5	99.75	442	6
881	5	99.75	453	6
1046	5	99.75	537	6
1090	5	99.75	558	6

TABLE: Sales (10,407 rows) COLUMN: Sales Revenue (0 distinct values)

Fields

Search

Sales

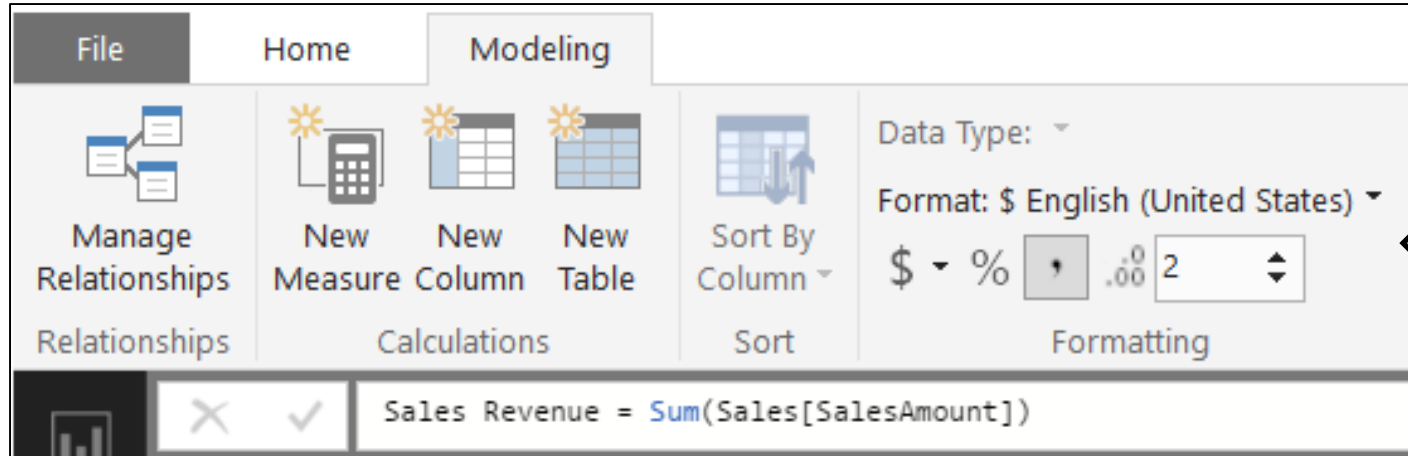
- Id
- InvoiceId
- ProductId
- Quantity
- Sales Revenue
- SalesAmount
- Units Sold

Customers

Purchases

Formatting Columns and Measures

- Each column & measure has formatting properties
 - Make sure you set formatting for columns and measures





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Modeling Data using Power BI Desktop

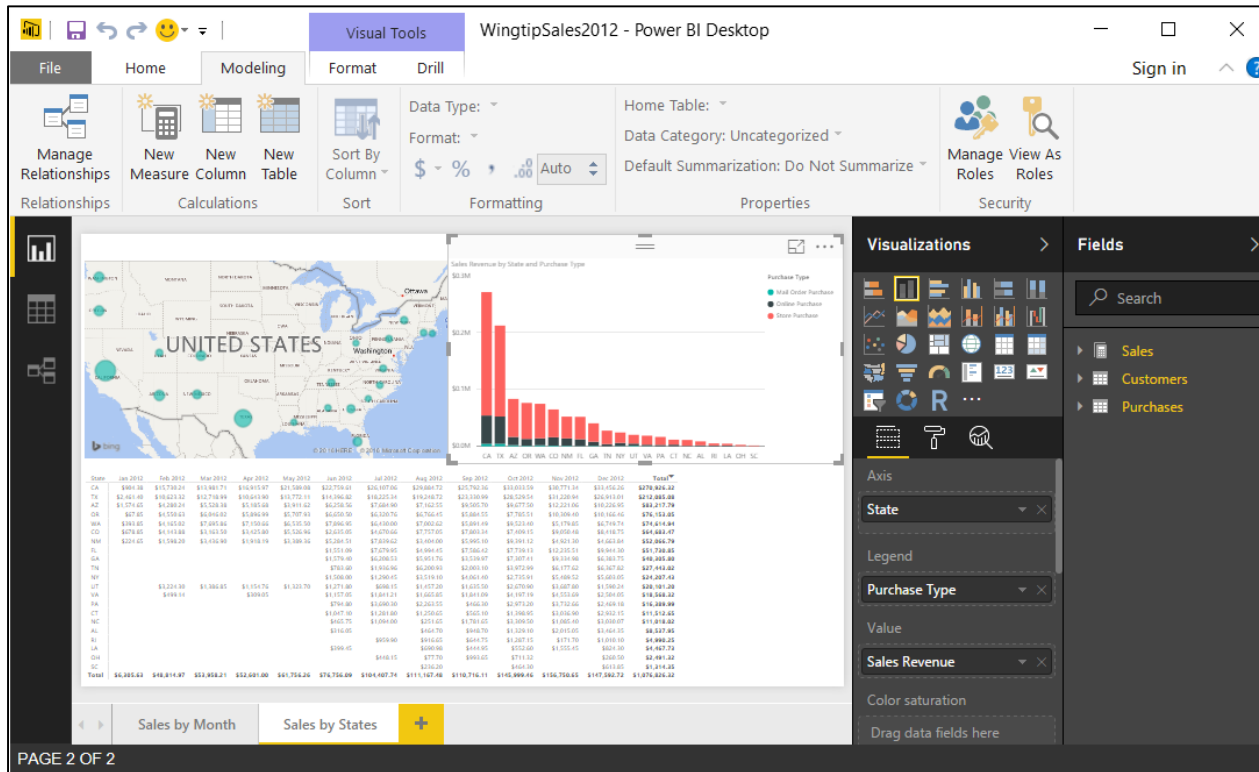
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Designing Reports

- Report View is used to design reports
 - You design reports by adding visuals & configuring them
 - Report design is very similar to experience in browser





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Designing a Report in Power BI Desktop

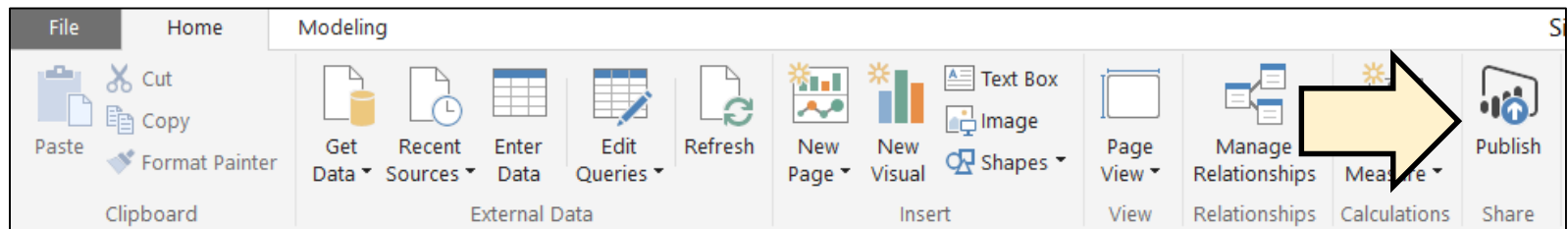
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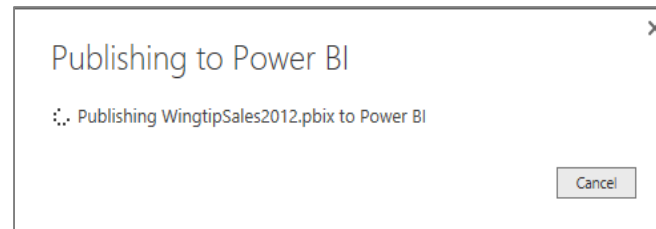
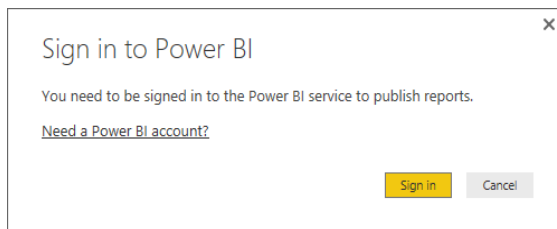


Publishing a Power BI Desktop Project

- Power BI Desktop provides **Publish** command
 - Used to publish project to Power BI service



- Requires logging into your Office 365 account



- Published articles added to target workspace



A Published Power BI Desktop Project

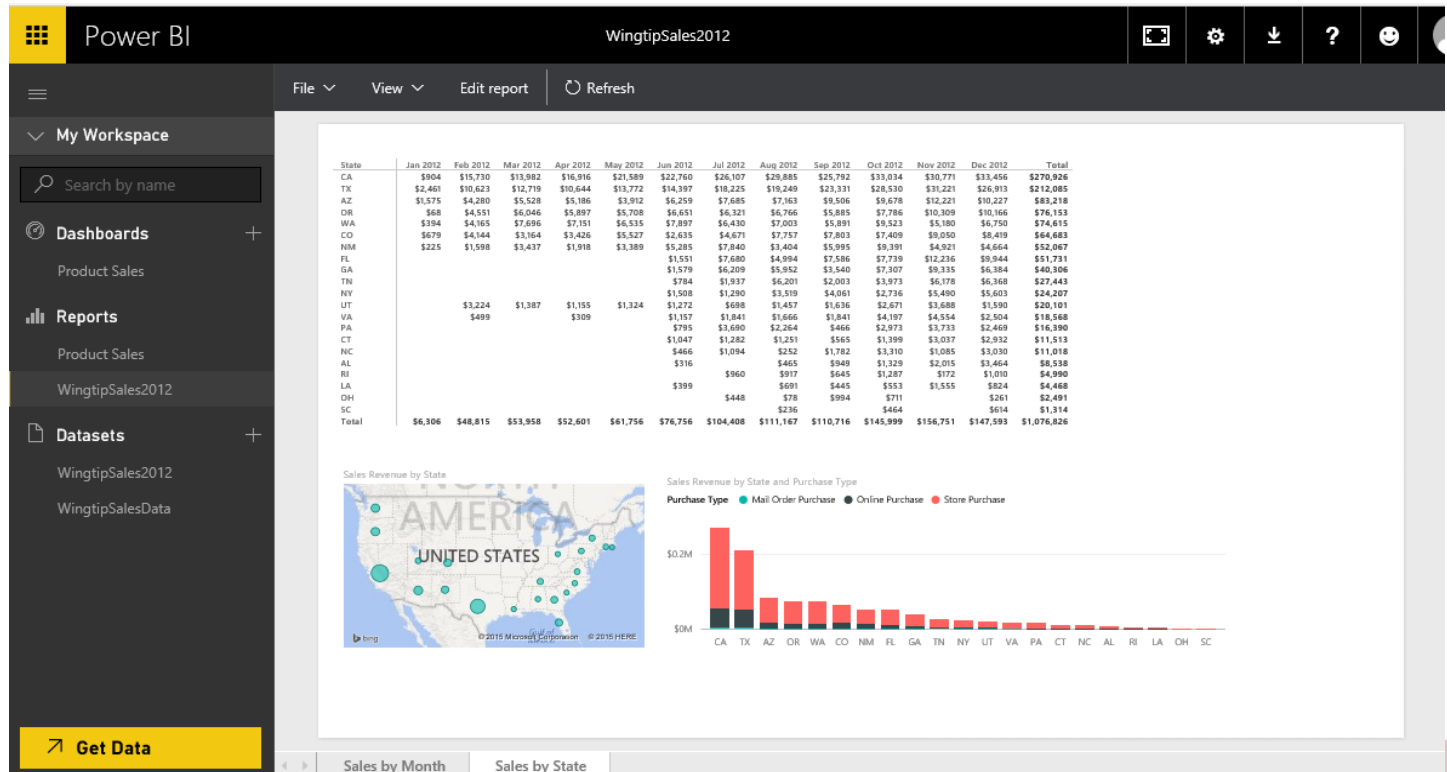
Publishing to Power BI

✓ Success!

[Open WingtipSales2012.pbix in Power BI](#)

Close

Cancel





DEMO

Publishing a Data Analysis Project using Power BI Desktop

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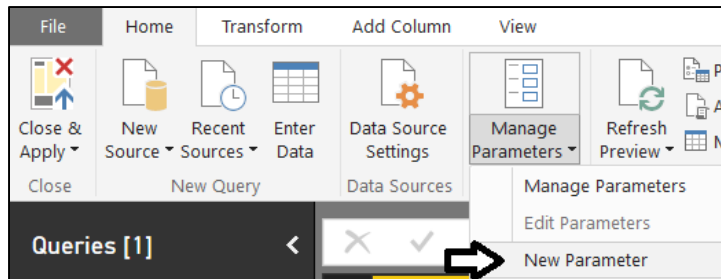
Query Parameters

- What is a Query Parameter?
 - Configurable setting with project scope
 - Strongly-typed value to which you can apply restrictions
 - Can be referenced from a query
 - Can be referenced from DAX code in data model
- Where are Parameters commonly used
 - To parameterize data source connection details
 - To filter rows when importing data



Creating Query Parameters

- Parameters can be created using **Manager Parameters** menu



- Parameter properties

- Name
- Description
- Required
- Allowed Values
- Default Value
- Current Value

Parameters

New

Customer State

Name: Customer State

Description: This parameter is used in the Customers query to filter the customer rows which are loaded into the dataset for the Power BI Desktop project.

☒ Required

Type: Text

Allowed Values: List of values

1	CA
2	OR
3	WA
4	AZ
5	TX
*	

Default Value: CA

Current Value: CA

OK Cancel

Referencing Parameters in a Query

- Parameters can be referenced inside query
 - Next query execution uses current parameter value

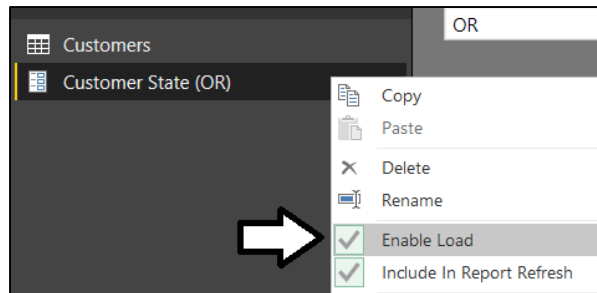
The screenshot shows a 'Filter Rows' dialog box with a close button (X) in the top right corner. It has two tabs: 'Basic' (unselected) and 'Advanced' (selected). Below the tabs, it says 'Show rows where:'. There are two columns of headers: 'And/Or' and 'Column', 'Operator', and 'Value'. The first row has a yellow highlight under the 'And/Or' header. The first row's 'Column' is 'State', 'Operator' is 'equals', and 'Value' is 'Customer State'. The second row's 'And/Or' is 'And', 'Column' is 'State', 'Operator' is empty, and 'Value' is 'A^B_C'. There is an 'Add Clause' button at the bottom left, and 'OK' and 'Cancel' buttons at the bottom right.

And/Or	Column	Operator	Value
	State	equals	Customer State
And	State		A ^B C

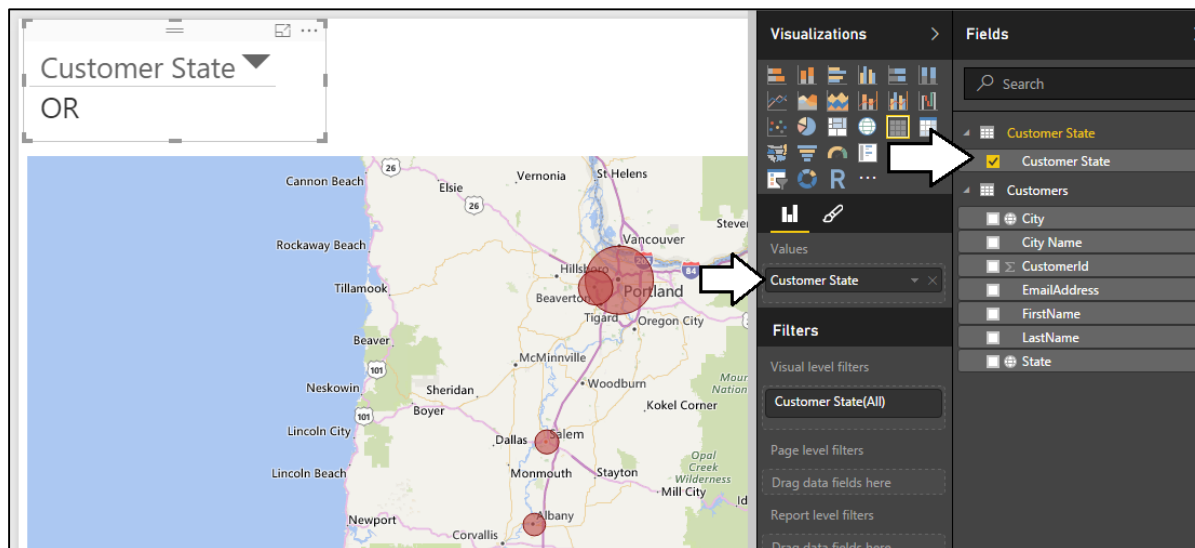


Making Parameters Available to Data Model

- Configure parameter's Enable Load setting

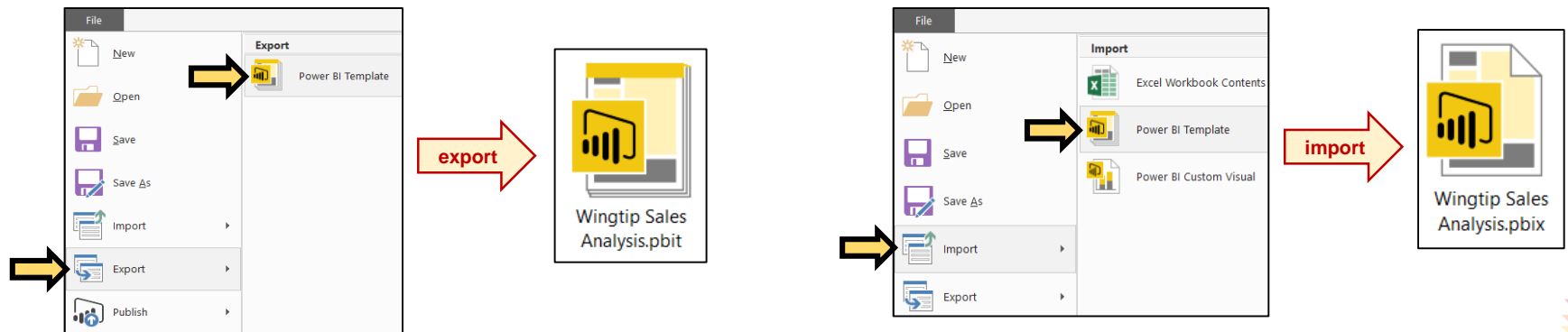


- Parameter becomes visible within fields list in report view



Power BI Project Template Files

- PBIX project can be exported to project template file
 - Template file created with PBIT file extension
 - Generated template files contains everything except for the data
 - PBIT template file can be imported to create new PBIX projects
 - Template files are powerful when used together with parameters
- How are template files used?
 - Export PBIX project to create a PBIT template file
 - Import the PBIT template file to create a new PBIX project



Summary

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