

Getting Started with Power BI Desktop



Student Background

- What is your name?
- What are you doing with Power BI?
- Which products have you used
 - Access
 - Excel
 - SQL Server, SSRS, SSAS
 - Others



Agenda

- What Is Power BI?
 - Getting Started with Power BI Desktop
 - Creating Queries in Power BI Desktop
 - Modeling Data in Power BI Desktop
 - Designing Reports in Power BI Desktop



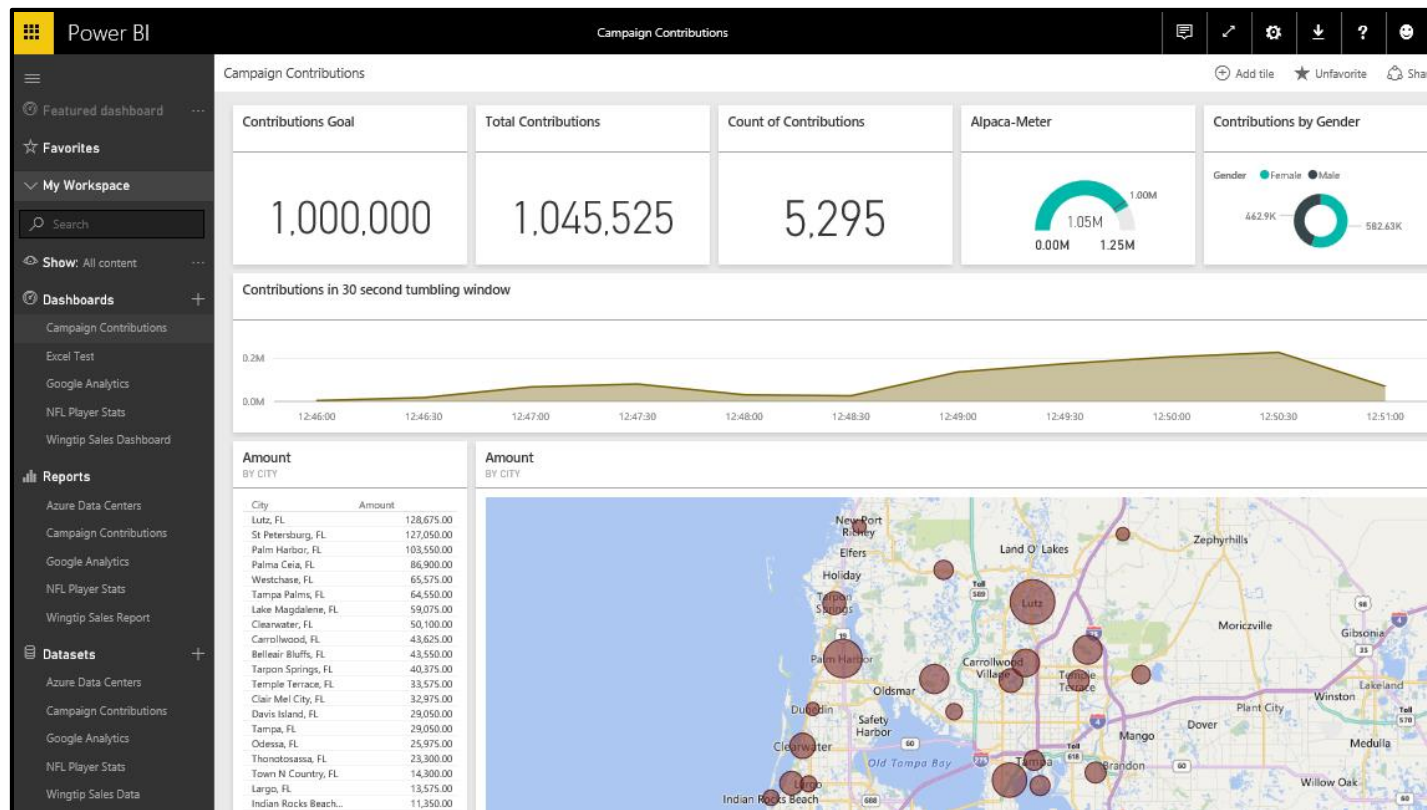
What is Power BI?

- What is Power BI?
 - Cloud-based subscription service
 - Environment which promotes self-service BI *to the end user*
 - BI Platform to assists with data import, analysis and visualization
- Power BI benefits from being a cloud-based service
 - It takes only 5 seconds to subscribe to the Power BI service
 - New users can create something significant in 5 minutes or less
- Power BI adoption numbers *(as of Q1 2016)*
 - 5 million subscribers
 - 200,000 organizations
 - 40 different languages



The Power BI Service

- The Power BI Service
 - Provides cloud-based foundation for Power BI platform
 - Accessible through browser at <https://app.powerbi.com>



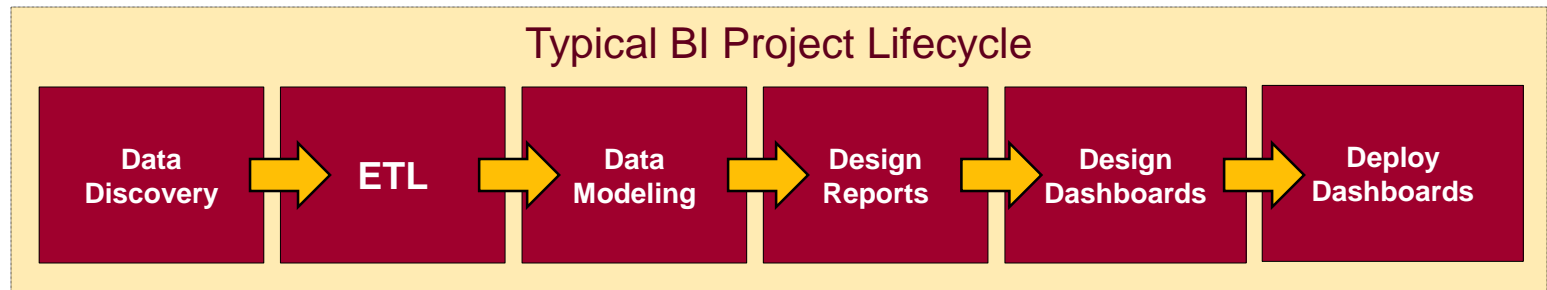
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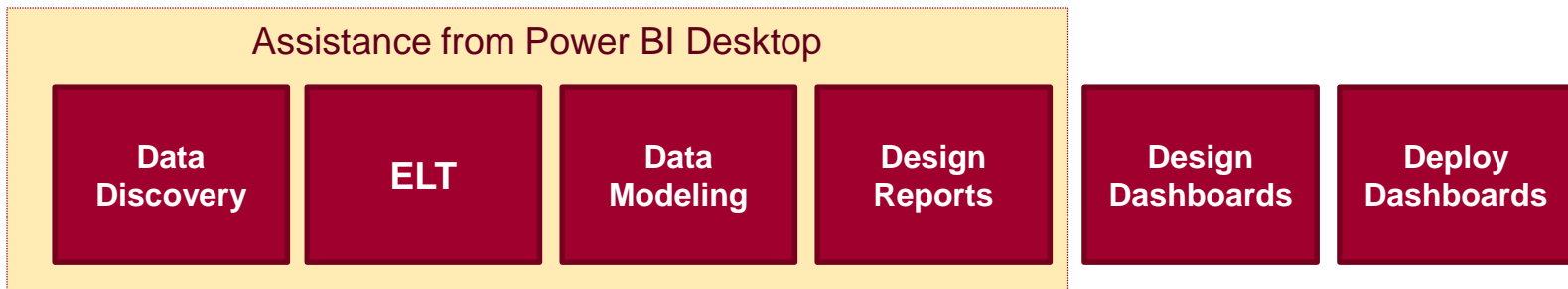
Project Lifecycle for a Custom BI Solution

- 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



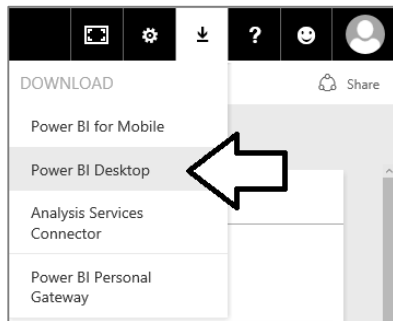
Working with Power BI Desktop

- 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



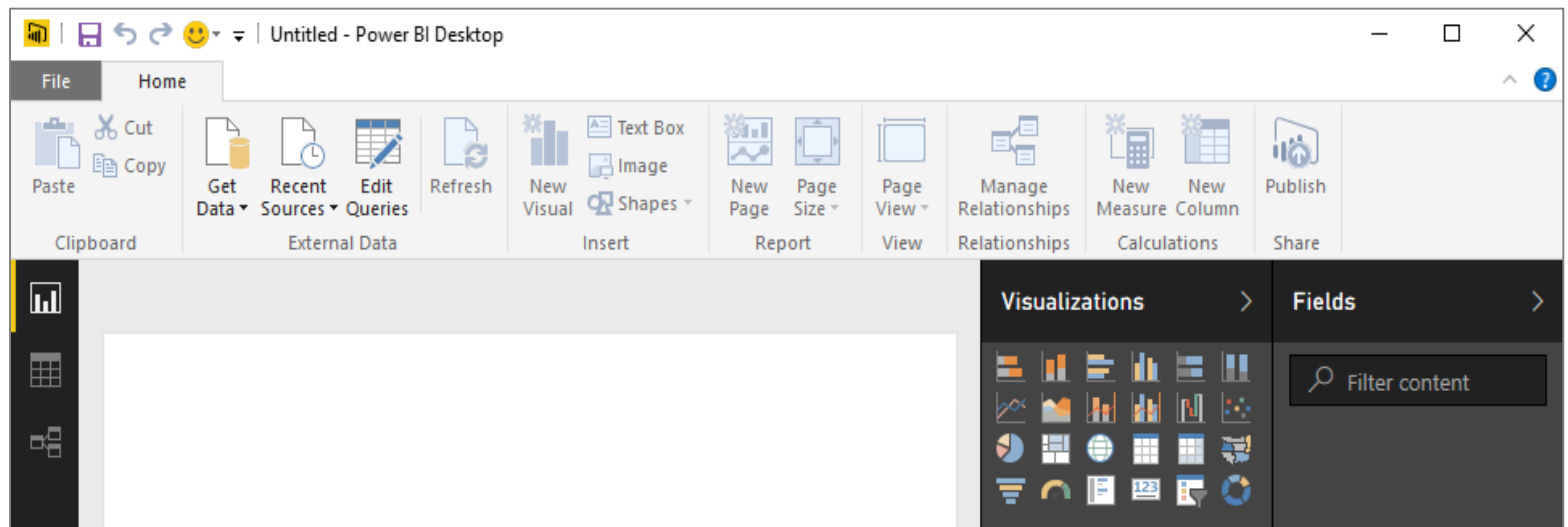
Installing Power BI Desktop

- 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



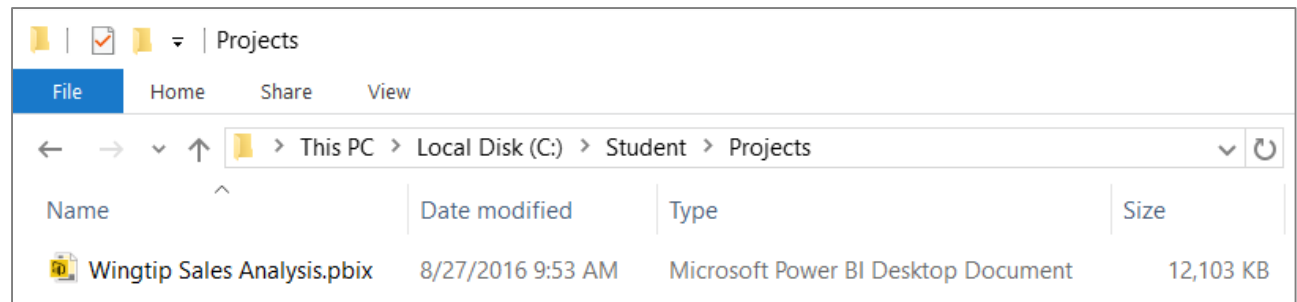
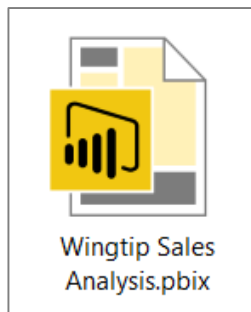
Working with Power BI Desktop

- 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



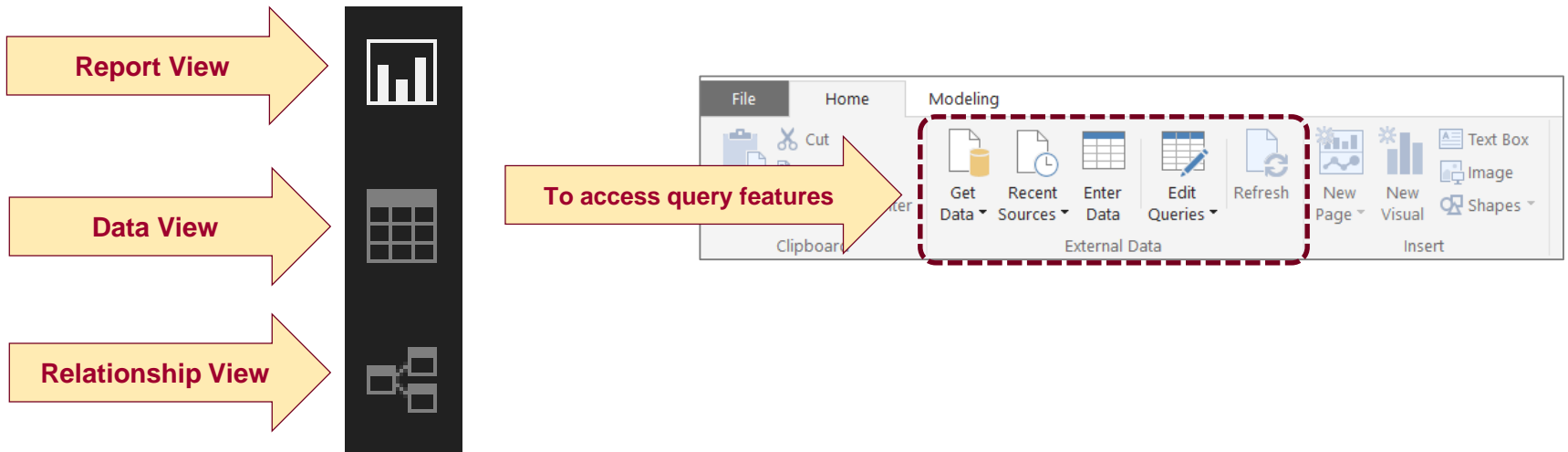
Projects and PBIX Files

- 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



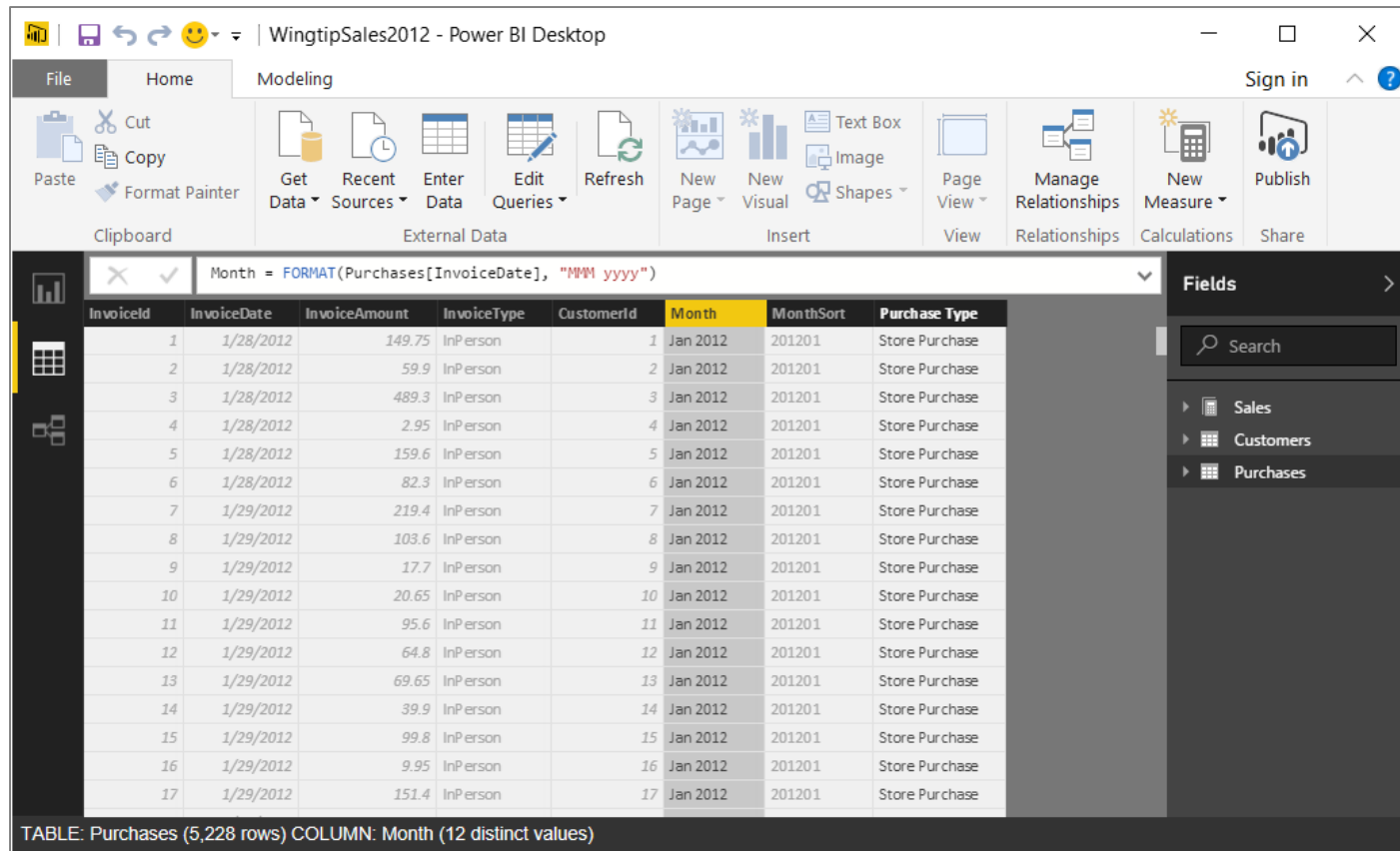
Getting Around in Power BI Desktop

- 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



The screenshot shows the Power BI Desktop interface with the 'Data View' tab selected. The ribbon includes 'File', 'Home', and 'Modeling'. The 'Modeling' ribbon has options like 'Get Data', 'Recent Sources', 'Enter Data', 'Edit Queries', 'Refresh', 'New Page', 'New Visual', 'Text Box', 'Image', 'Shapes', 'Page View', 'Manage Relationships', 'New Measure', and 'Publish'. A red arrow points to the 'Data View' icon in the left-hand navigation pane.

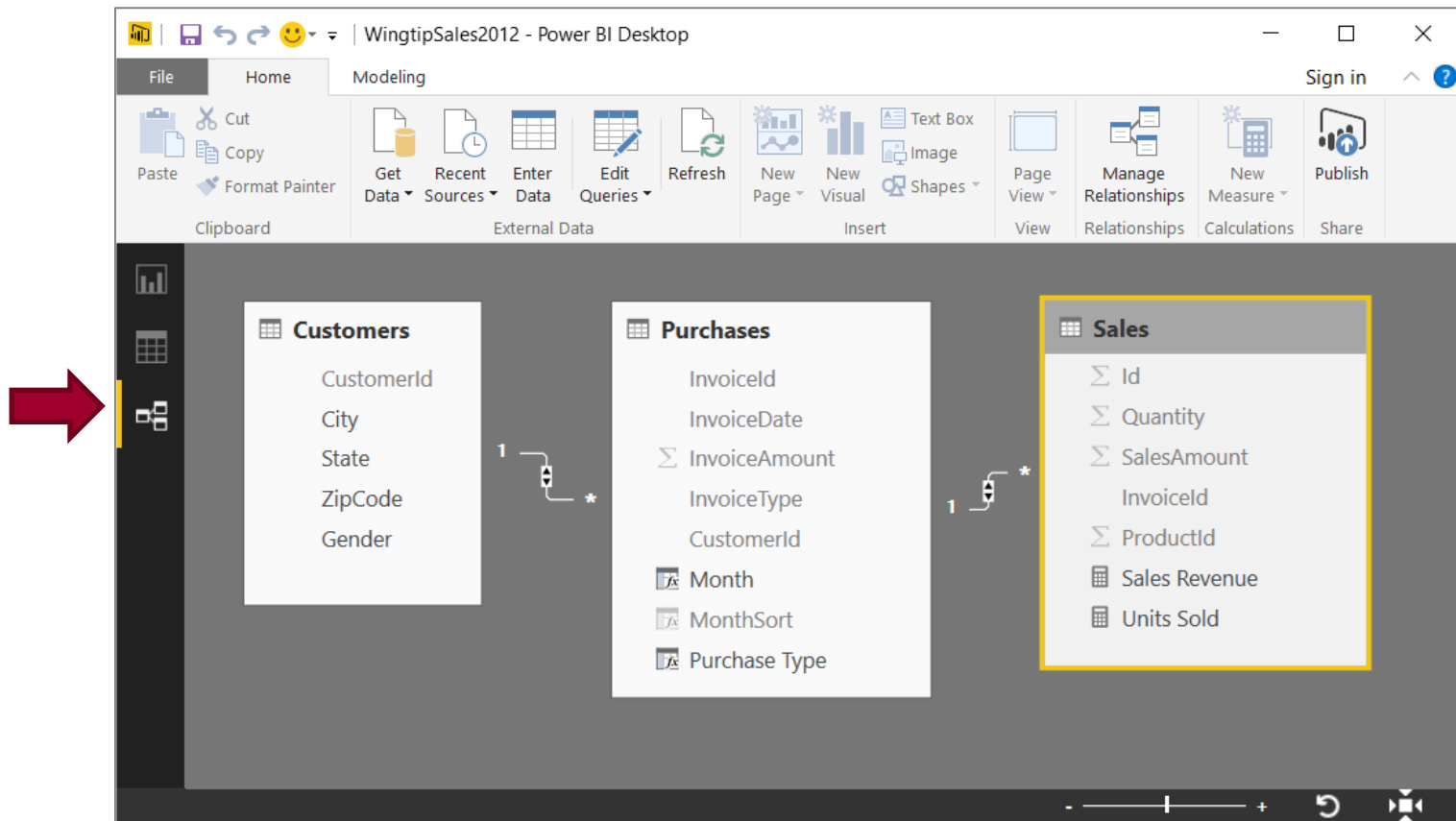
The main area displays a table with the following columns: InvoiceId, InvoiceDate, InvoiceAmount, InvoiceType, CustomerId, Month, MonthSort, and Purchase Type. The 'Month' column is highlighted in yellow. The table contains 17 rows of data, all with a 'Store Purchase' type. The 'Month' column values are calculated using the formula: `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

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

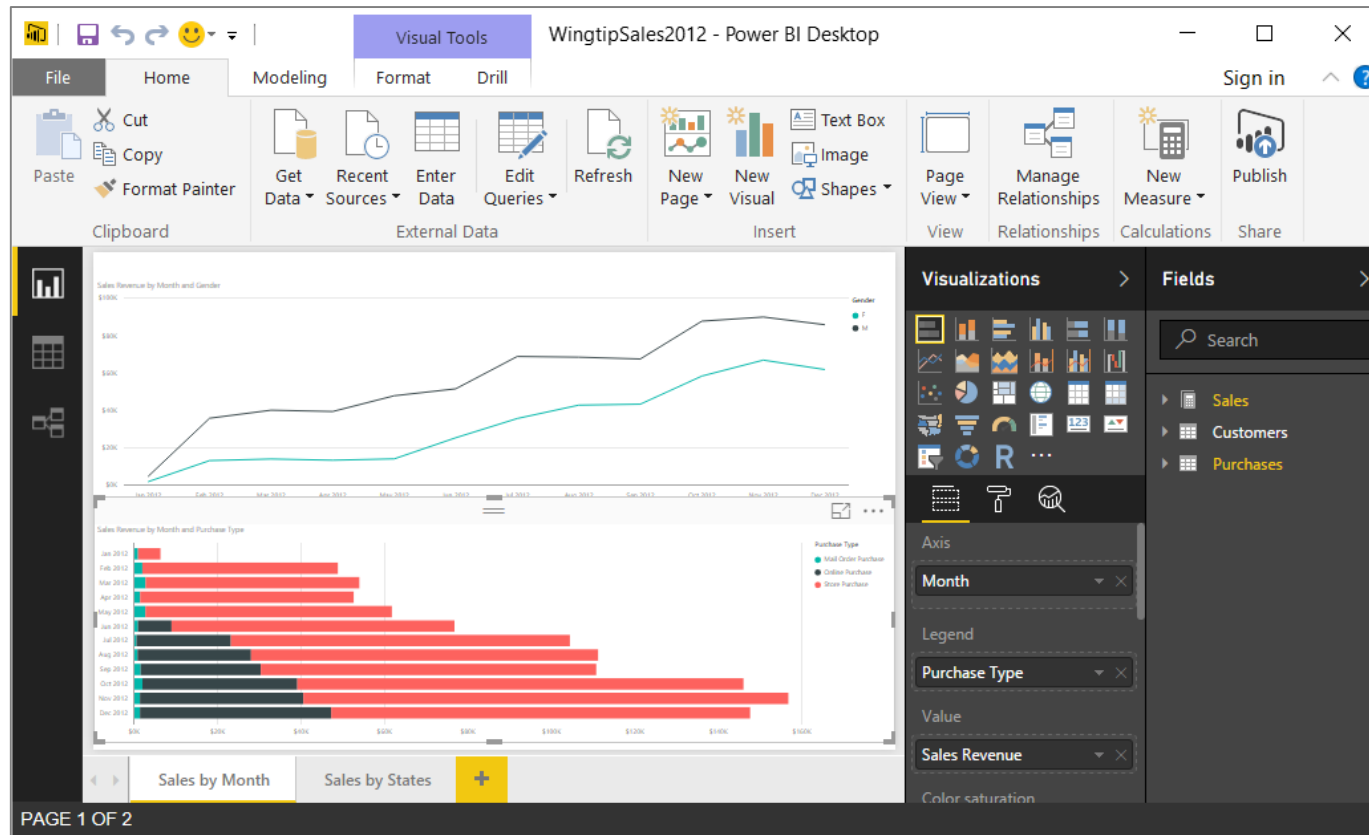
Relationship View

- 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





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Getting Up and Running with Power BI Desktop

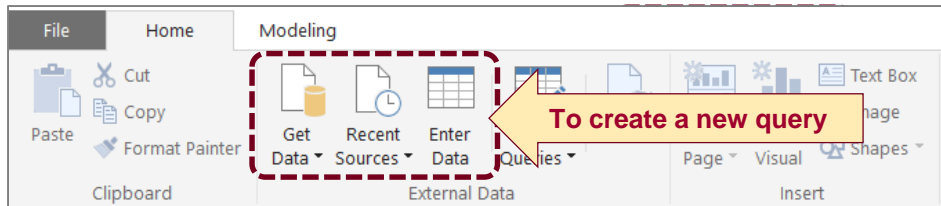
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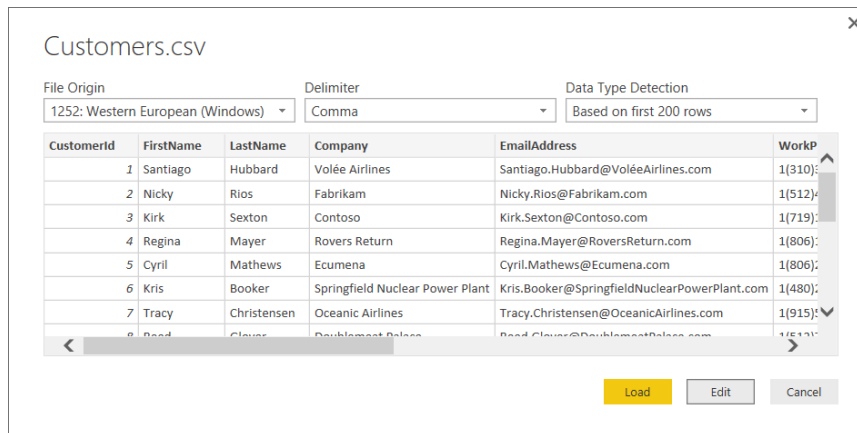


Creating Queries

- 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



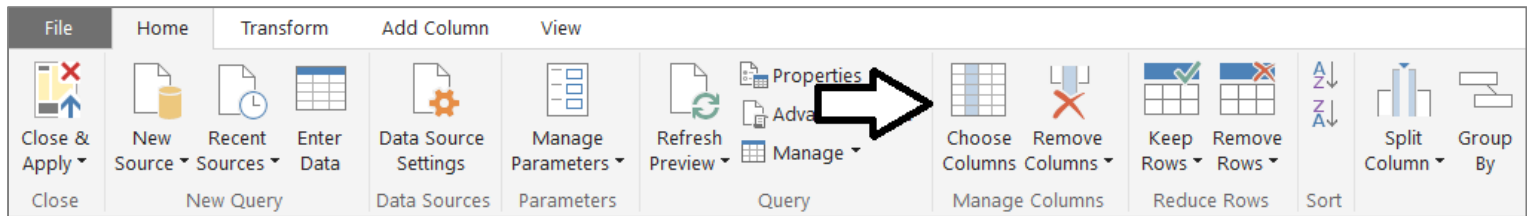
Query Editor Window

- 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

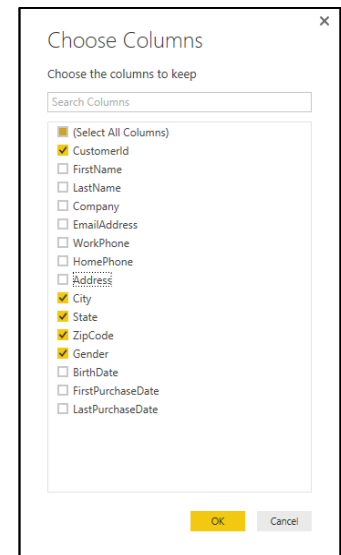
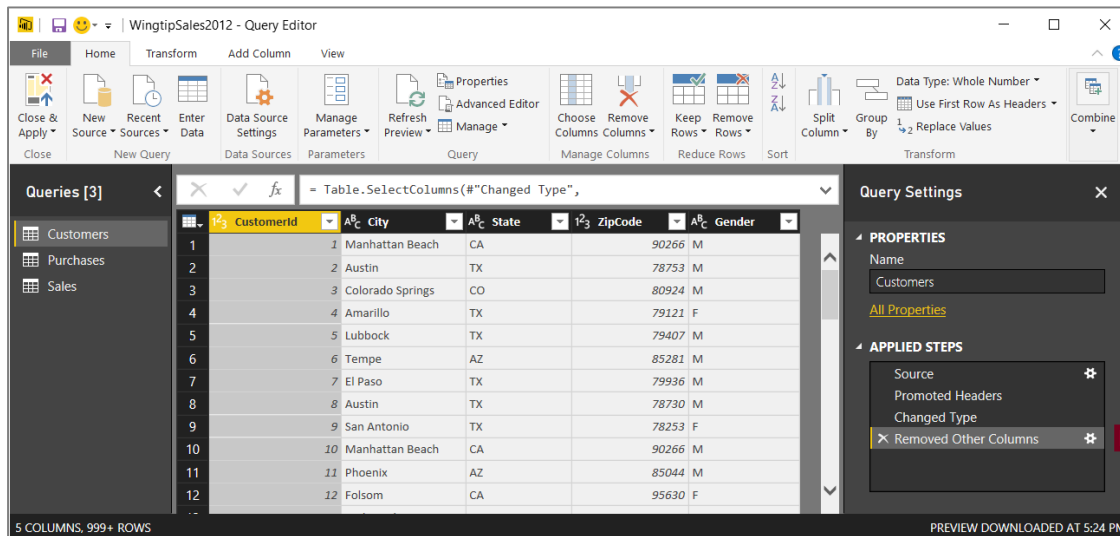


Queries Are Defined as Sequence of Steps

- 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

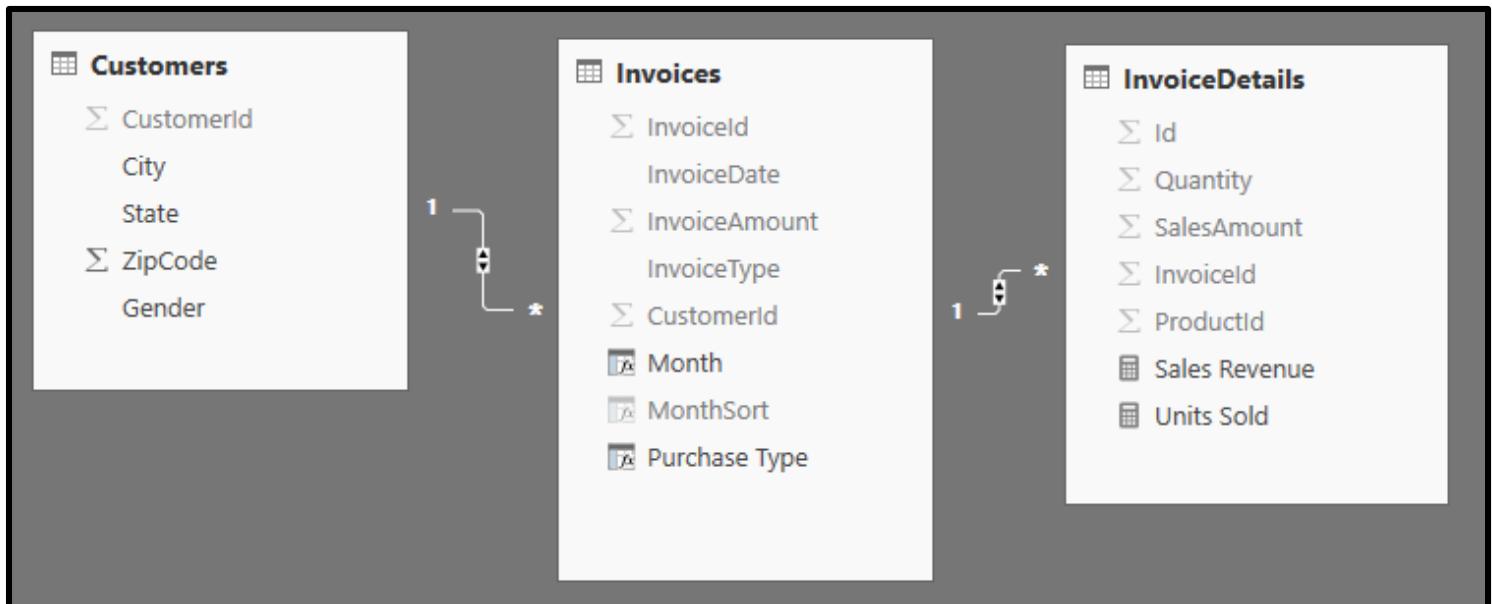
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The Project's Data Model

- 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 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 selected, with 'Purchase Type' listed as a calculated column.

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
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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

TABLE: Purchases (5,228 rows) COLUMN: Purchase Type (3 distinct values)

Creating Measures

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

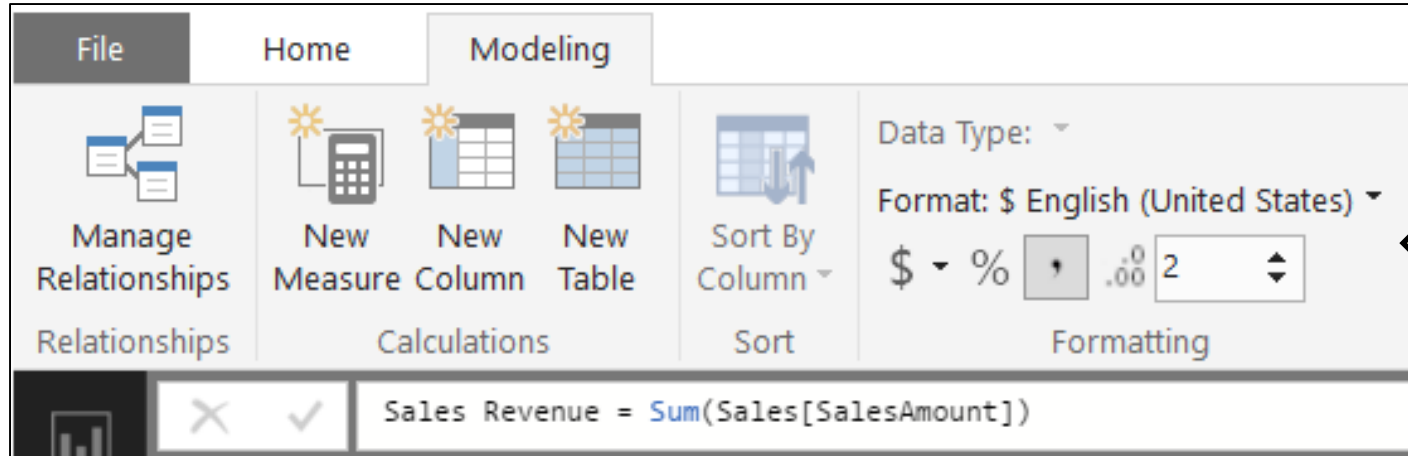
The screenshot shows the Power BI Desktop interface. The ribbon is set to the 'Modeling' tab. A yellow arrow points to the 'New Measure' button in the 'Calculations' group. The 'Sales Revenue' measure is defined in the formula bar as `Sales Revenue = Sum(Sales[SalesAmount])`. The 'Fields' pane on the right shows the 'Sales' table with columns 'Id', 'Quantity', 'SalesAmount', 'InvoiceId', and 'ProductId'. The 'Sales Revenue' measure is highlighted in the list. A yellow arrow points to the 'Sales Revenue' measure in the 'Fields' pane. The main view displays a table with columns 'Id', 'Quantity', 'SalesAmount', 'InvoiceId', and 'ProductId'. The table contains 10 rows of data. The status bar at the bottom indicates 'TABLE: Sales (10,407 rows) COLUMN: Sales Revenue (0 distinct values)'.

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



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

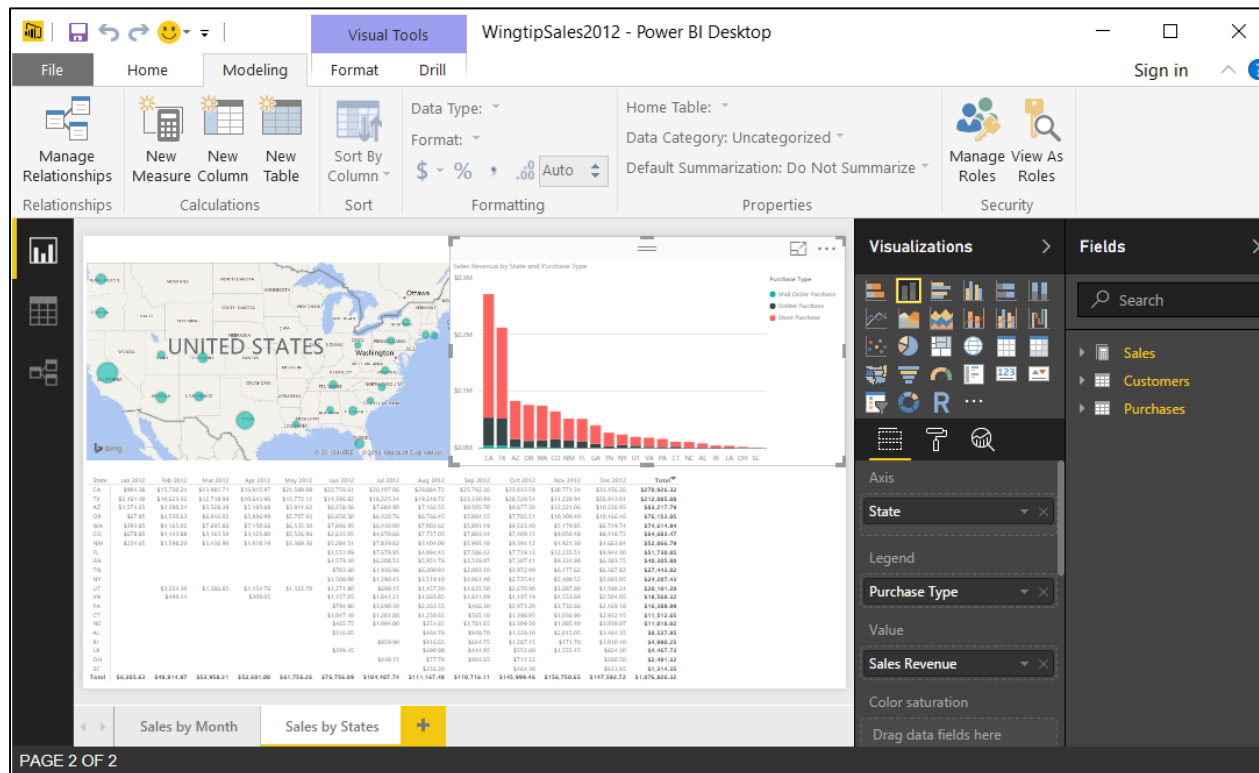
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Designing Reports

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



Reports and Pages

- Reports contain one or more pages
 - A report can be designed with a single page
 - A report can be designed with many pages
 - Tabbed navigation located at bottom of report view
 - Each report is associated with exactly one dataset

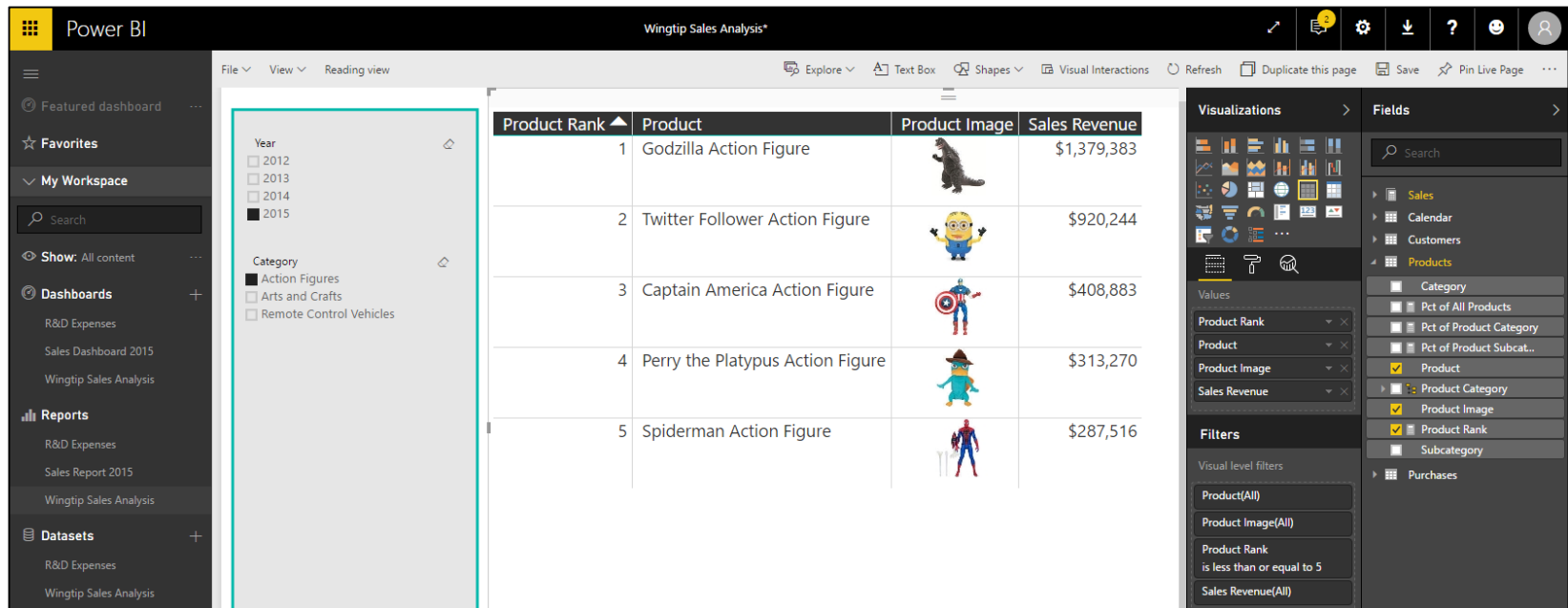







Report Authoring

- Report initially opens in reading view
 - Click Edit report to switch to edit mode



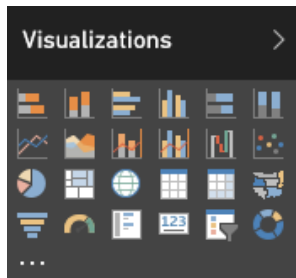
- Report design tools appear on right side of page

A screenshot of the Power BI report authoring interface. The report is titled 'Wingtip Sales Analysis' and is in 'Reading view'. The main content area displays a table with 5 rows of product data. On the left, there is a sidebar with filters for 'Year' (2012, 2013, 2014, 2015) and 'Category' (Action Figures, Arts and Crafts, Remote Control Vehicles). On the right, there is a 'Visualizations' pane with various chart types and a 'Fields' pane with a list of data fields. The 'Fields' pane is currently expanded, showing a search bar and a list of fields including 'Sales', 'Calendar', 'Customers', 'Products', 'Category', 'Pct of All Products', 'Pct of Product Category', 'Pct of Product Subcat...', 'Product', 'Product Category', 'Product Image', 'Product Rank', 'Subcategory', and 'Purchases'. The 'Visualizations' pane shows a list of visualizations including 'Product Rank', 'Product', 'Product Image', and 'Sales Revenue'. The 'Filters' pane shows a list of filters including 'Product(All)', 'Product Image(All)', 'Product Rank is less than or equal to 5', and 'Sales Revenue(All)'.

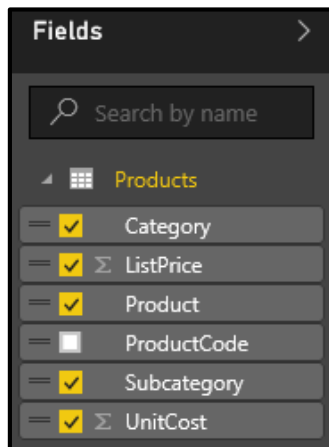
Product Rank	Product	Product Image	Sales Revenue
1	Godzilla Action Figure		\$1,379,383
2	Twitter Follower Action Figure		\$920,244
3	Captain America Action Figure		\$408,883
4	Perry the Platypus Action Figure		\$313,270
5	Spiderman Action Figure		\$287,516

Visuals (aka Visualizations)

- Reports are designed using visual (aka visualizations)
 - Each visual is based on an underlying visualization type
 - Visualization type can be changed using **Visualizations** pane

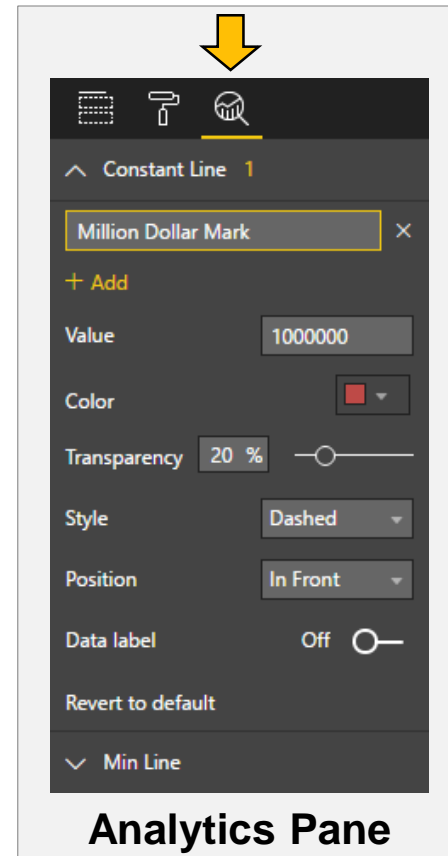
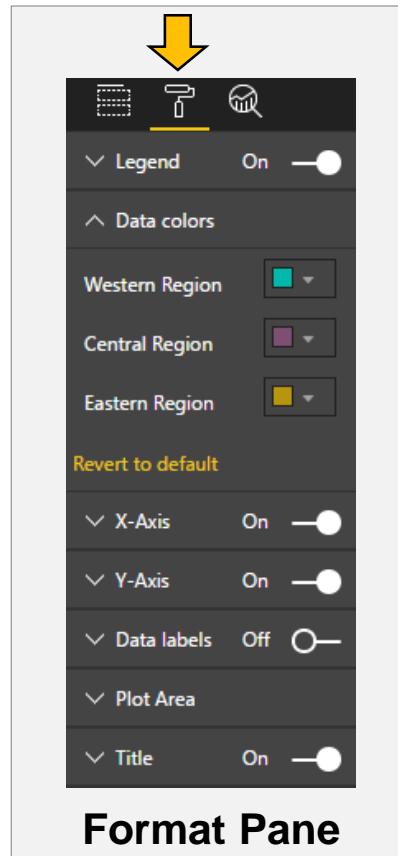
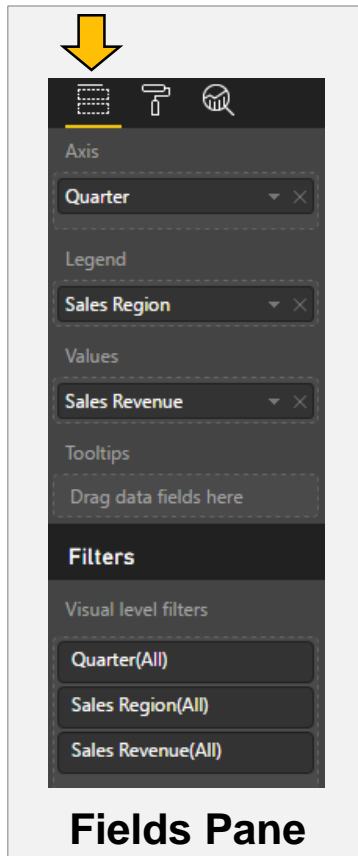


- Visuals creating by using fields from tables inside **Fields** list



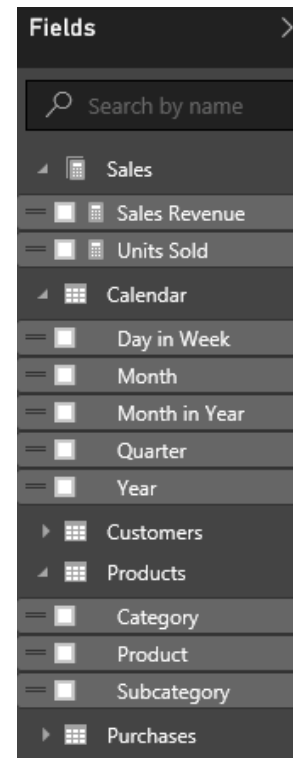
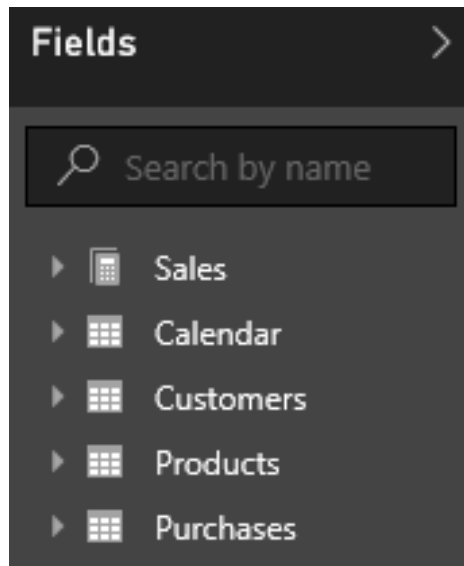
Editing Visual Properties

- Visual properties modified using three property panes
 - Visual properties vary greatly depending on type of visualization



Report and Datasets

- Each report is based on an underlying dataset
 - **Fields** list in report designer shows tables and fields
 - Report author sees tables & fields as dataset consumer





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Designing a Report in Power BI Desktop

Summary

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