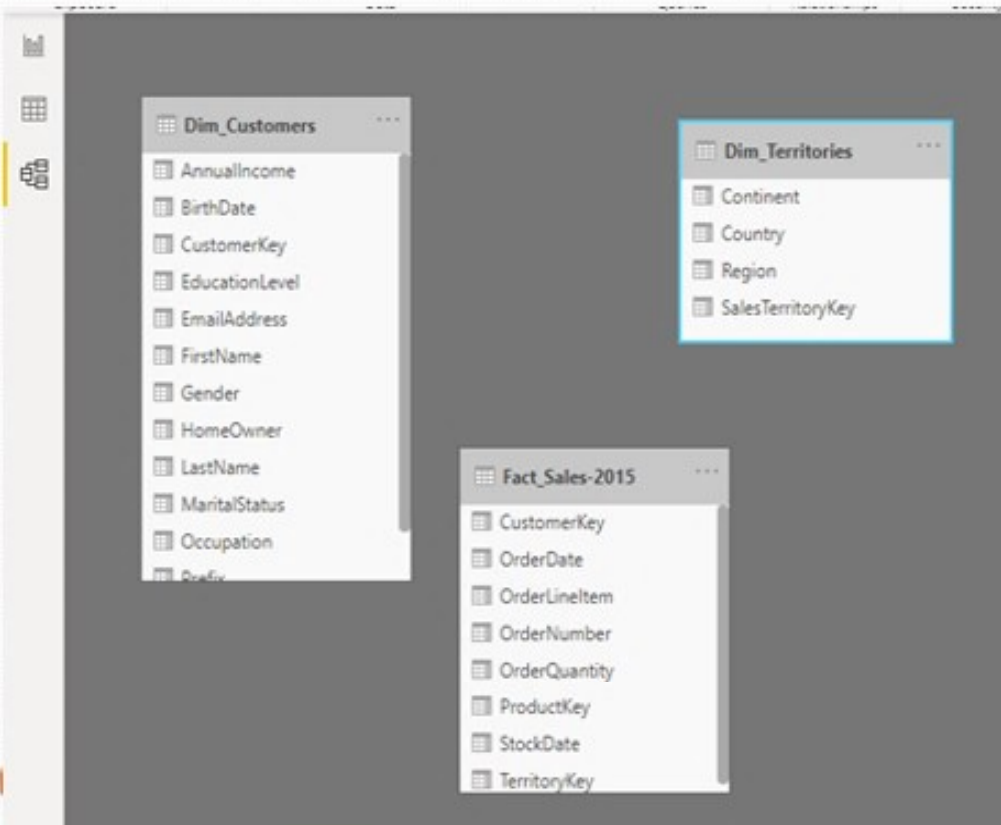# Data Modeling in Power BI

## Akriti Lal

What is a "DATA MODEL"?

These are Independent tables loaded to Power BI. This is not a DATA MODEL.

- So, if we try to visualize **Orders** and **Returns** by **Product**, we will get repetition of values for all the Products, because the data does not have the capability to work as interlinked/ or as one.

ProductName	OrderQuantity	ReturnQuantity
All-Purpose Bike Stand	84,174	1,828
AWC Logo Cap	84,174	1,828
Bike Wash - Dissolver	84,174	1,828
Cable Lock	84,174	1,828
Chain	84,174	1,828
Classic Vest, L	84,174	1,828
Classic Vest, M	84,174	1,828
Classic Vest, S	84,174	1,828
Fender Set - Mountain	84,174	1,828
Total	**84,174**	**1,828**

What is a "DATA MODEL"?
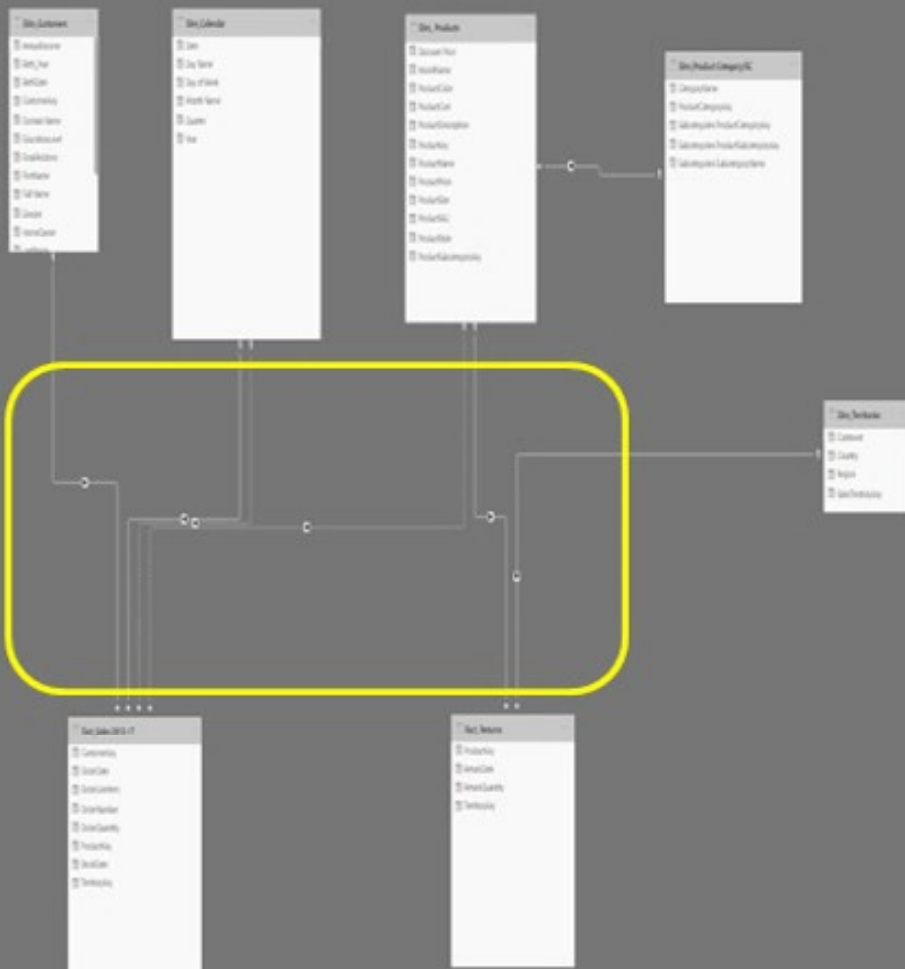
When the tables are connected through relationships, based on the common field, then it is a DATA MODEL. Once the tables have relationship then tables know how to filter using fields from each other.

ProductName	OrderQuantity	ReturnQuantity
All-Purpose Bike Stand	234	8
AWC Logo Cap	4,151	46
Bike Wash - Dissolver	1,706	25
Classic Vest, L	182	4
Classic Vest, M	182	7
Classic Vest, S	157	8
Fender Set - Mountain	3,960	54
Half-Finger Gloves, L	840	18
Half-Finger Gloves, M	918	16
Total	84,174	1,828

Primary & Foreign Key

Primary Key

This uniquely identify each row of a table. E.g. Product ID in Products table.

Foreign Key

Contains multiple instances of each value and are used to match with Primary key in related lookup table. E.g. Product ID in Returns Table.
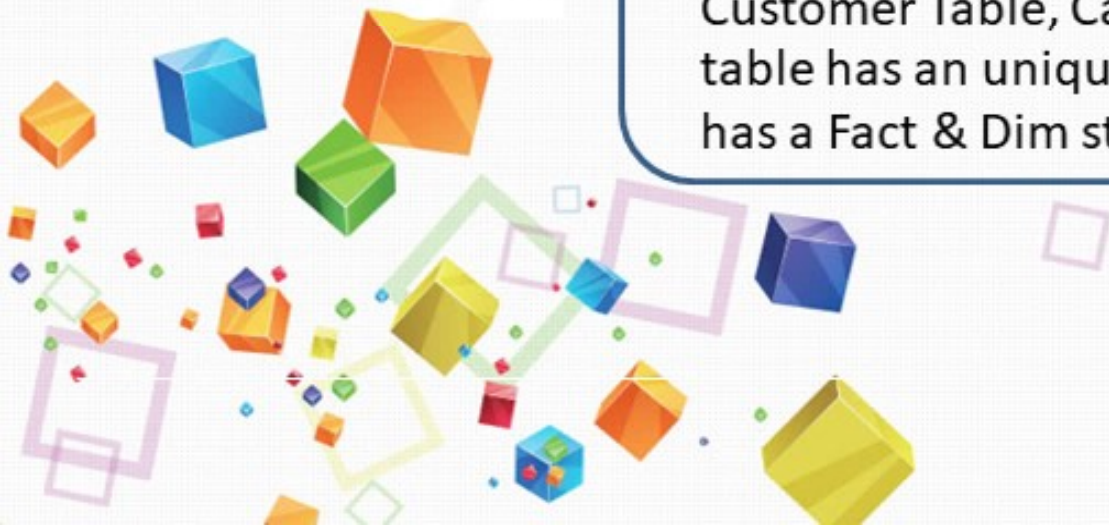
02

Data table structure

De- Normalized Data:

Here the data is in an open structure. All the information comes in multiple columns from a Table. This table has multiple Ids.
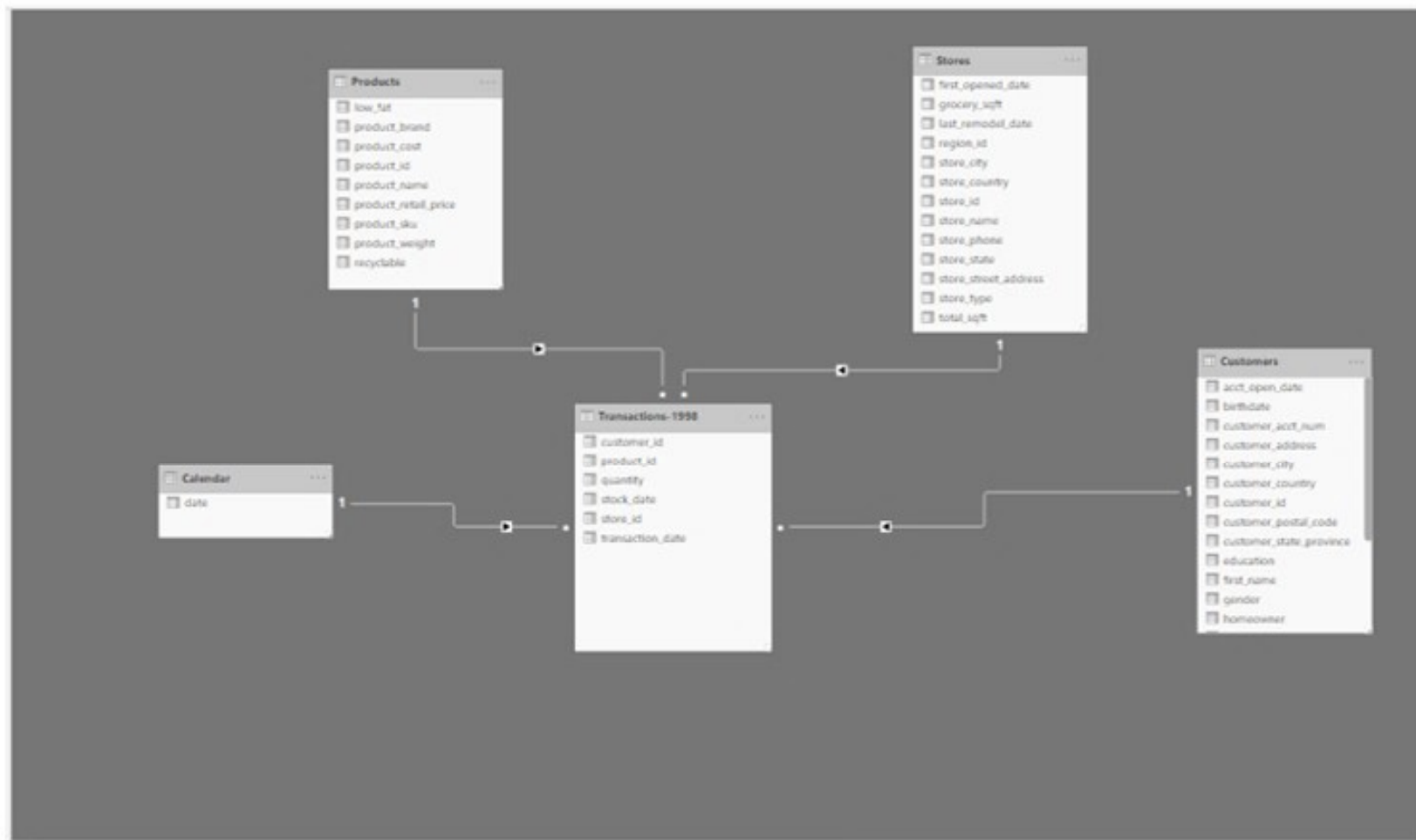
Normalized Data:

Here each business category holds an individual table. For eg: Product Table, Customer Table, Calendar Table. Each table has an unique key or an Id. This has a Fact & Dim structure.
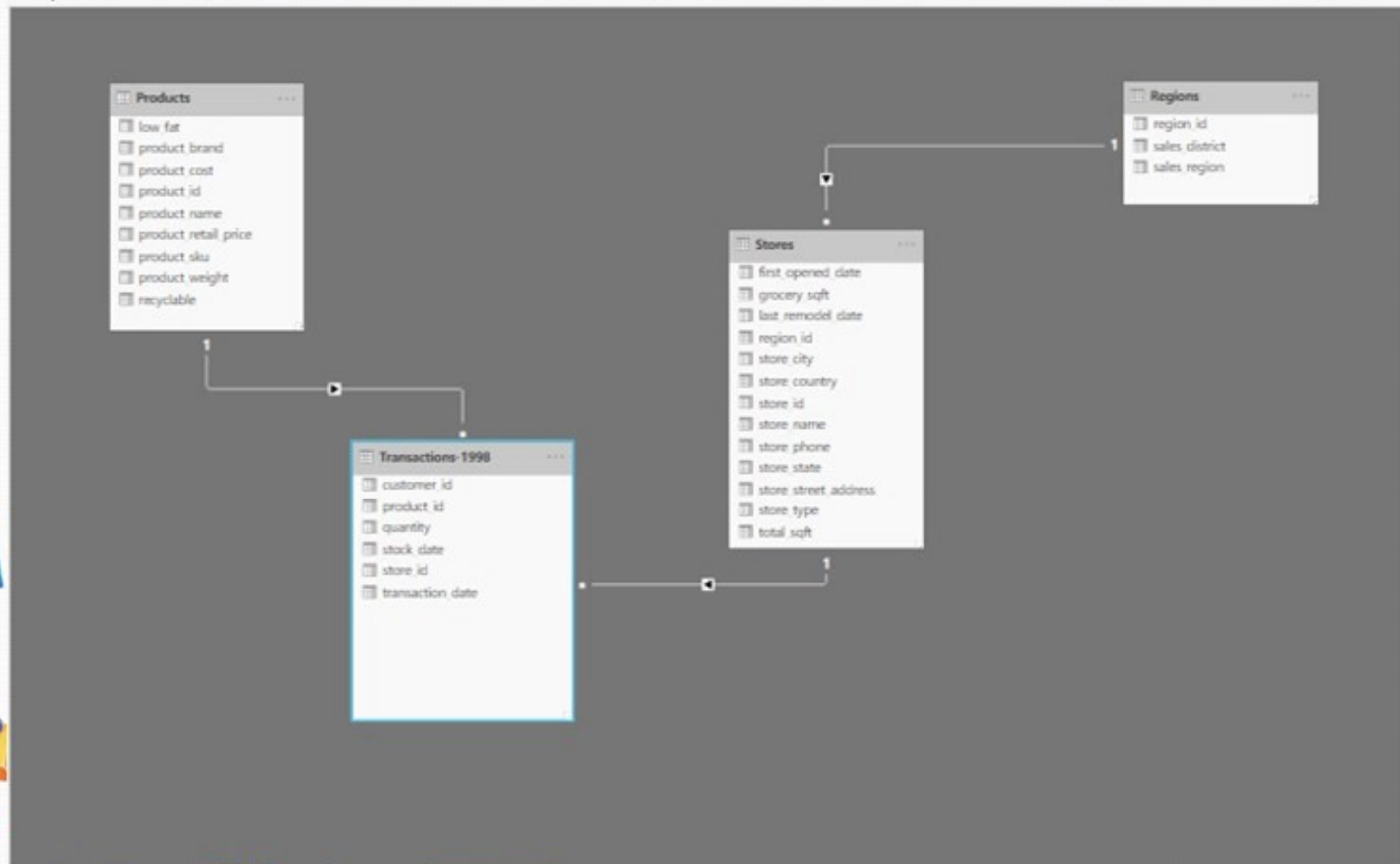
Creating Star Schema

The Star Schema is the optimized data model for reporting. In Star schema, everything is one join away.
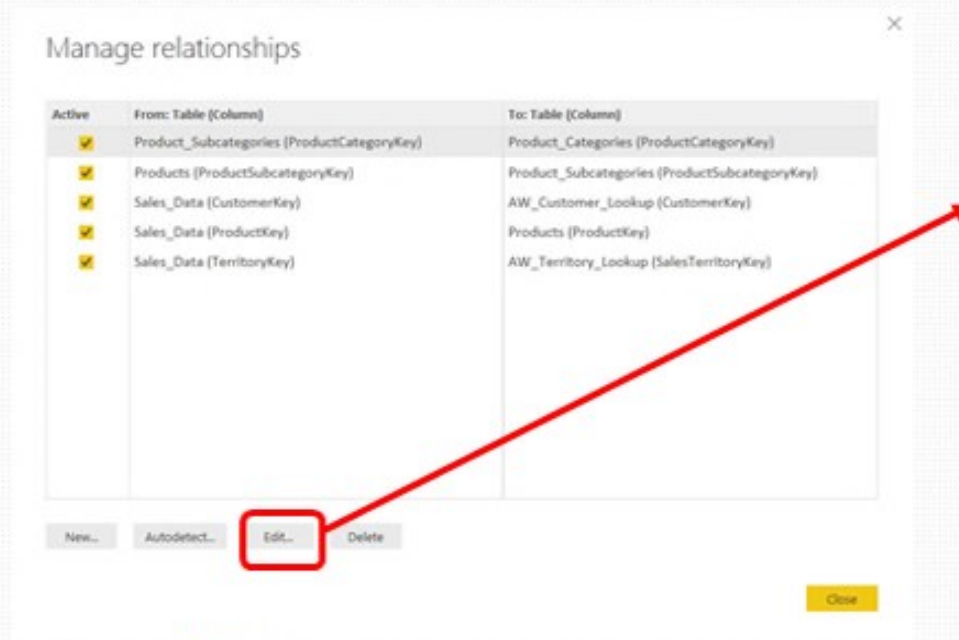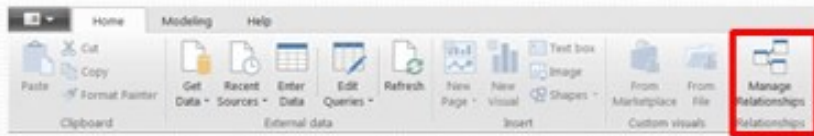
Creating Snowflakes Schema

When a Dimension table has a primary key which doesn't exist as foreign key in a Data table but in another dim table, which in turn is connected to the data table, the relationship formed between the dim tables called a "Snowflake" schemas.

Manage and Edit Relationship

Home | Modeling | Help

Paste | Cut | Copy | Format Painter | Get Data | Recent Sources | Enter Data | Edit Queries | Refresh | New Page | New Visual | Text box | Image | Shapes | From Marketplace | From File | Manage Relationships

Clipboard | External data | Insert | Custom visuals | Relationships

Manage relationships

Active	From: Table (Column)	To: Table (Column)
✔	Product_Subcategories (ProductCategoryKey)	Product_Categories (ProductCategoryKey)
✔	Products (ProductSubcategoryKey)	Product_Subcategories (ProductSubcategoryKey)
✔	Sales_Data (CustomerKey)	AW_Customer_Lookup (CustomerKey)
✔	Sales_Data (ProductKey)	Products (ProductKey)
✔	Sales_Data (TerritoryKey)	AW_Territory_Lookup (SalesTerritoryKey)

New... | Autodetect... | Edit... | Delete

Close

Edit relationship

Select tables and columns that are related.

Sales_Data

OrderDate	StockDate	OrderNumber	ProductKey	CustomerKey	TerritoryKey	OrderLineItem	Order
7/19/2016	6/2/2003	SO51472	606	26654	9	1	
7/25/2016	5/16/2003	SO51579	606	26656	9	1	
8/9/2016	4/24/2003	SO52323	606	20152	9	1	

AW_Customer_Lookup

CustomerKey	Prefix	FirstName	LastName	BirthDate	MaritalStatus	Gender	EmailAddress
11206	Mr.	Blake	Flores	9/24/1948	M	M	blake60@adventure-w
11214	Mr.	Charles	Miller	11/7/1949	S	M	charles9@adventure-w
11227	Mr.	Marshall	Chavez	8/12/1951	S	M	marshall35@adventure

Cardinality

Many to one (*:1)

Cross filter direction

Single

✔ Make this relationship active

Apply security filter in both directions

Assume referential integrity
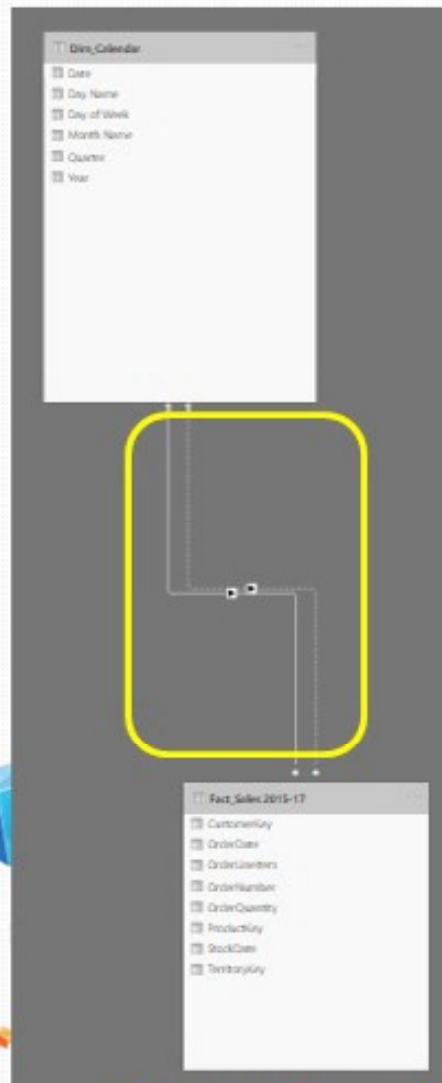
OK | Cancel

The "Manage Relationships" dialog box allows you to add, edit, or delete table relationships

Editing tools allow you to activate/deactivate relationships, view cardinality, and modify the cross filter direction (stay tuned!)

Active and Inactive Relationship

The **Sales_Data** table contains two date fields (**OrderDate** & **StockDate**), but there can only be one *active* relationship to the Date field in the Calendar table

Double-click the relationship line, and check the *"**Make this relationship active**"* box to toggle (note that you have to deactivate one in order to activate another)

Cardinality In Relationship
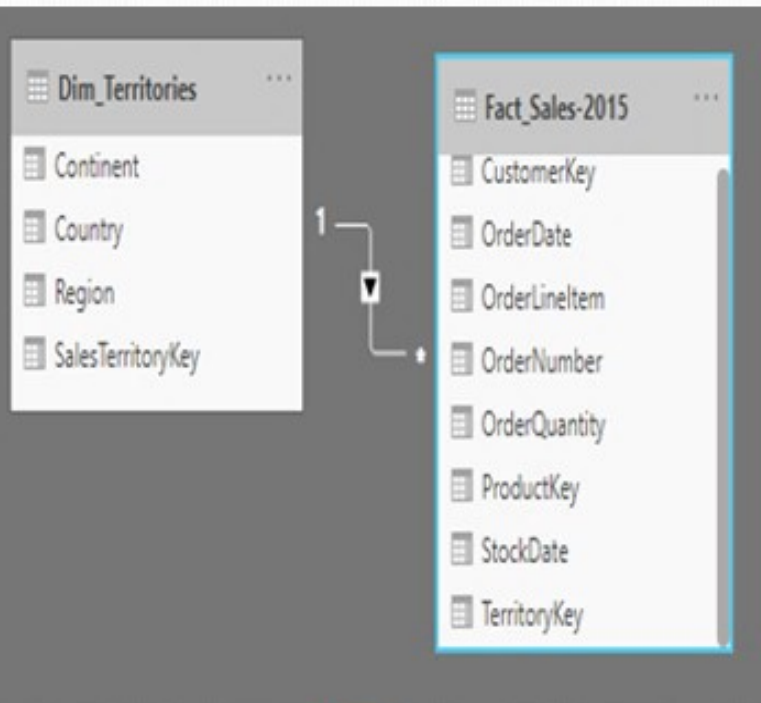
Cardinality refers to the uniqueness of values in a column. All relationships in the data model should follow a "**one-to-many**" cardinality; **one** instance of each primary key in the dim table, but **many** instances of each foreign key in fact table

For e.g: One Id in the Territory table will have many instances / rows of that Id in Fact_Sales table