HOMEWORK: Creating Table Relationships & Data Models in PBI

Using your Adventure Works report file, complete the following:

**1)** Navigate to the **RELATIONSHIPS**view, and perform the following actions:

* Right-click to delete each relationship between **AW\_Sales**, **AW\_Customer\_Lookup** and **AW\_Calendar\_Lookup** (*including both date fields*)
* Use the **Manage Relationships** tool to delete *all* remaining relationships between all tables.

**2)** Recreate all table relationships (*using any method you prefer*), and confirm the following:

* Cardinality is **1-to-Many** for all relationships
* Filters are all **One-Way**(*no two-way filters*)
* Filter direction correctly flows "**downstream**" to data tables
* Data tables are **not connected** directly to one another
* Both data tables are connected to **all valid lookup tables**
* Product-related tables follow a **snowflake schema**

**3)** Return to the **REPORT**view, and complete the following:

* Edit (*or insert*) the  matrix visual to show **ReturnQuantity** (*values*) by **CategoryName** (*rows*) from the **AW\_Product\_Category\_Lookup** table
  + *Which category saw the highest volume of returns? How many?*
* Replace **CategoryName** with **Year**from the **AW\_Calendar\_Lookup** table
  + *How many returns do you see in 2015 vs. 2016?*
* Replace **Year** with **FullName** from the **AW\_Customer\_Lookup** table
  + *What do you see, and why?*
* Update the matrix to show **OrderQuantity** and **ReturnQuantity** (*values*) by **ProductKey** (*rows*) from the **AW\_Product\_Lookup** table
  + *What was the total OrderQuantity for Product #338?*

**4)**Unhide the **ProductKey** field from the **AW\_Returns** tables (*using either the****DATA****or****RELATIONSHIPS****view)*:

* In the matrix, replace **ProductKey** from **AW\_Product\_Lookup** with **ProductKey**from the **AW\_Returns** table
  + *Why do we the same repeating values for OrderQuantity?*
* Edit the relationship between **AW\_Returns** and **AW\_Product\_Lookup** to change the cross filter direction from *Single* to *Both*
  + *Why does the visual now show OrderQuantity values by product, even though we are using****ProductKey****from****AW\_Returns****?*
  + *How many orders do we see now for Product #338? What's going on here?*

**5)** Complete the following:

* Change the cross filter direction between **AW\_Returns** and **AW\_Product\_Lookup** back to *single* (*One-Way*)
* Hide the **ProductKey** field in the **AW\_Returns** table from report view (*and any other foreign keys, if necessary*)
* Update the matrix to show **ProductKey** from the **AW\_Product\_Lookup**, rather than **AW\_Returns**
* **Recommendation:** Save a separate backup copy of the .pbix file (*i.e. "AdventureWorks\_Report\_Backup"*)

HOMEWORK: Analyzing Data with DAX Calculations in Power BI

Using the Adventure Works report, complete the following:

**1)**In the **DATA**view, create the following **calculated columns**:

* In the **AW\_Customer\_Lookup** table, add a new column named "**Customer Priority**" that equals "*Priority*" for customers who are under 50 years old and have an annual income of greater than $100,000, and "*Standard*" otherwise
* In the **AW\_Product\_Lookup** table, add a new column named "**Price Point**", based on the following criteria
  + *If the product price is greater than $500,****Price Point****= "High"*
  + *If the product price is between $100 and $500,****Price Point****= "Mid-Range"*
  + *If the product price is less than or equal to $100,****Price Point****= "Low"*
* In the **AW\_Calendar\_Lookup** table, add a new column named "**Short Day**" to extract and capitalize the first three letters from the **Day Name**column
* In the **AW\_Product\_Lookup** table, add a column named "**SKU Category**" to extract the first two characters from the **ProductSKU** field
* ***BONUS:****Modify the****SKU Category****function to return any number of characters up to the first dash (****Hint:****You may need to "search" long and hard for that dash...)*

**2)** In the **REPORT** view, create the following **measures** (*Use a matrix visual to match the "****spot check****" values provided*)

* Create a measure named "**Product Models**" to calculate the number of unique product model names
* ***Spot check:****You should see a total of****119****unique product models*
* Create a measure named "**ALL Returns**" to calculate the grand total number of returns, regardless of the filter context
* ***Spot check:****You should see a total of****1,809****returns*
* Create a measure to calculate "**% of All Returns**"
* ***Spot check:****You should see a value of****61.64%****for the****Accessories****product category*
* Create a measure named "**Bike Returns**" to calculate total returns for bikes specifically
* ***Spot check:****You should see a total of****427****bike returns*
* Create a measure named "**Total Cost**", by multiplying order quantities by product costs at the row-level
* ***Spot check:****You should see a total cost of****$14,456,986.32***
* Once you've calculated **Total Cost**, create a new measure for "**Total Profit**", defined as the total revenue minus the total cost
* ***Spot check:****You should see a total profit of****$10,457,580.86***
* Create a measure to calculate Total Orders for the previous month (named "**Prev Month Orders**")
* ***Spot check:****Create a matrix with "Start of Month" on rows to confirm accuracy*
* Create a measure named "**Order Target**", calculated as a 10% lift over the previous month
* ***Spot check:****Create a matrix with "Start of Month" on rows to confirm accuracy*
* *Total Returns for the previous month (named "****Prev Month Returns****")*
* ***Spot check:****Create a matrix with "Start of Month" on rows to confirm accuracy*
* *90-Day Rolling Profit (named "****90-day Rolling Profit****")*
* ***Spot check:****You should see a 90-day rolling profit of****$2,142,623.27***

**3)** Save a separate backup copy of the .pbix file (*i.e. "****AdventureWorks\_Report\_Backup****"*)