



## **Power BI**

### **Introduction Activities**

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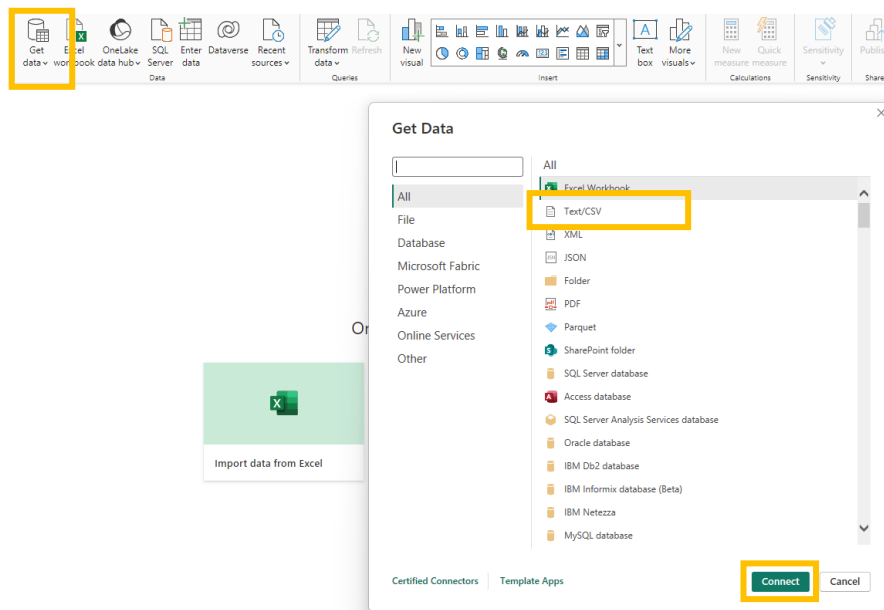
## Activity: Connecting Data

### Tasks:

- a) Create a New Power BI blank file.
- b) Save the file into your **PowerBI** folder – naming it **SALES REPORT**.



- c) Using the **GetData** option on your Home Ribbon Tab, select your data type choice as **Text/CSV**.



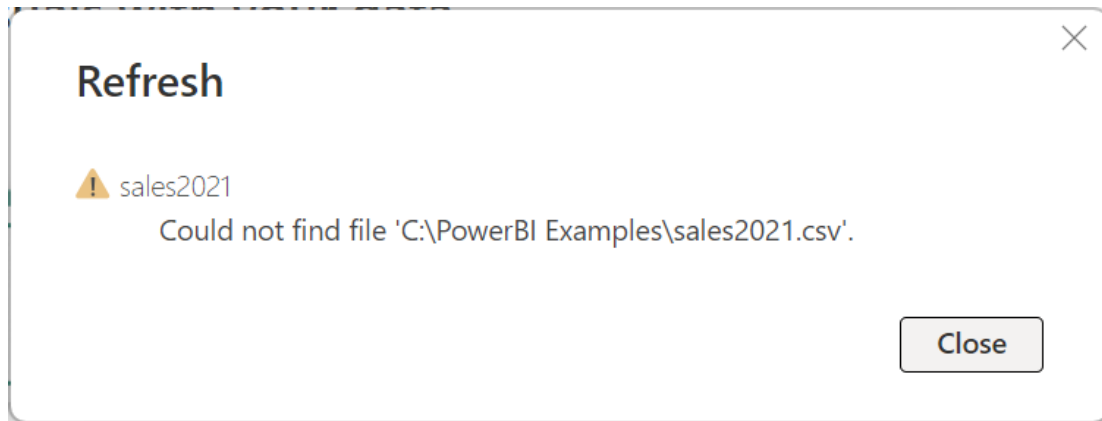
- d) Connect and load the **Sales2021.csv** file found in your **PowerBI** folder.
- e) Once complete save the file (leaving it open as we will return back to it) and switch back to the **TRAINING TEST** report file.

## Activity: Repointing Data

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### Tasks:

1. Open the file **REPOINTING DATA.PBIX**.
2. Refresh the file – notice the error, cannot locate the **Sales2021.CSV** file to connect.



3. Using the **Data Source Settings** option, repoint the data to the **PowerBI** folder containing your sample data files.
4. Apply the changes.
5. Once complete you can save and close the file.
6. Return to your **TRAINING TEST** report file.

## Activity: Applying Basic Steps – Columns/Rows, Filter, Data Type

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### Tasks:

1. With the **SALES REPORT** open, select the **Transform Data** button to switch into the Power Query Editor.
2. Apply the following steps to the data:
  - a) Using **Remove Top Rows** - remove the **first 3 rows** of data.
  - b) Using **Use First Row as Headers** - make sure the correct row is being used as the Column Headers.
  - c) Using **Remove Blank Rows** - remove all **Blank rows**.
  - d) Using **Remove Duplicates** – select the first column and remove the duplicates.
  - e) Using **Remove Columns** – remove the **Additional\_Detail** column.
  - f) Using **Filtering** – filter out the **Blanks** and **N/A** values in the **Order\_Amount** column.
  - g) Change the **Column Data Types** as follows:

<b>Order_ID</b>	Whole Number
<b>Order_Amount</b>	Fixed Decimal Number
<b>Customer_ID</b>	Whole Number
<b>Employee_ID</b>	Whole Number
<b>Order_Date</b>	Date
<b>Required_Date</b>	Date
<b>Ship_Date</b>	Date

3. **Apply** the changes made.
4. Once complete save the file (leaving it open as we will return back to it) and switch back to the **TRAINING TEST** report file.

## Activity: Applying Complex Steps – Group/Split, Extract

### Tasks:

1. With the **SALES REPORT** open, select the **Transform Data** button to switch into the Power Query Editor.
2. Use the **New Source** button on the Home Tab to add the following two **Text/CSV** files:

**Customer.csv**

**Employee.csv**

3. Make sure the two new query files have the first row applied as **Use First Row as Headers**.
4. Apply the following steps to the 2 new data queries:

#### Customer Query

- a) Using **Extract (between delimiters)** - update the **Contact\_Position** column by removing the parentheses around the position name.
- b) Using **Split Column (by delimiter)** – split the **Contact\_Name** column at the space – as some of the Lastnames have spaces in, the result will be 5 columns for all parts of the Contact Name.
- c) Using **Merge Columns** – select the **Contact\_Name.3**, **Contact\_Name.4** and **Contact\_Name.5** columns, merge them with the following settings:

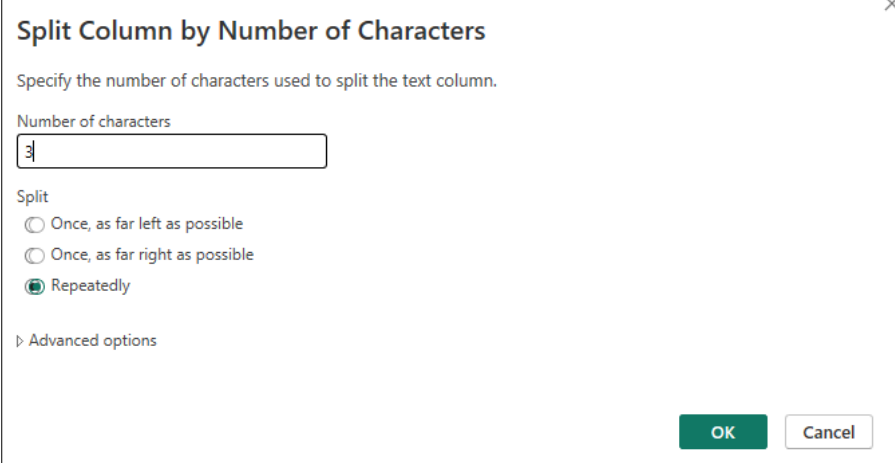
- d) **Rename** the column **Contact\_Name.1** to be **Contact\_Title** and **Contact\_Name.2** to **Contact\_Firstname**.
- e) Using **Split Column (by delimiter)** – split by delimiter the **Address3** column at the colon into 3 separate columns, rename them to **City**, **Region**, **Country**.
- f) Using **Format Trim** – remove all additional spaces within the **Customer\_Name** column.
- g) Apply the following Column Data Types:

<b>Customer_ID</b>	Whole Number
<b>Customer_Credit_ID</b>	Whole Number
<b>Last_Years_Sales</b>	Fixed Decimal Number
<b>Lat</b>	Decimal Number
<b>Long</b>	Decimal Number

- h) **Apply** your step changes.

**Employee Query**

- a) Using **Format (Capitalize Each Word)** – change the **EmployeeFirstName** column to have an Initial Capital for the name.
- b) Using **Split Column (by Number of Characters)**– split the **Payroll\_ID** column using the following settings:



**Split Column by Number of Characters**

Specify the number of characters used to split the text column.

Number of characters

3

Split

☐ Once, as far left as possible

☐ Once, as far right as possible

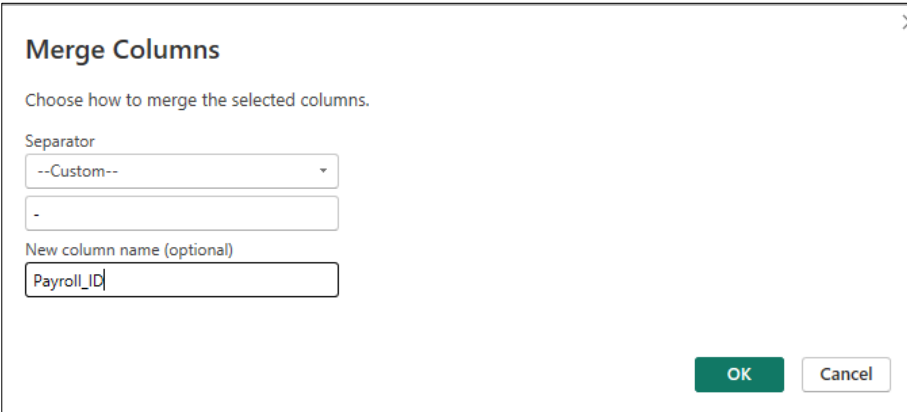
☒ Repeatedly

Advanced options

OK Cancel

This will split the column into 3 parts, we can now merge the columns to return the values back to one column in the format of 913-222-3455

- c) Using **Merge Columns** - select the three **Payroll\_ID** split columns, merge the columns using the following settings:



**Merge Columns**

Choose how to merge the selected columns.

Separator

--Custom--

-

New column name (optional)

Payroll\_ID

OK Cancel

d) Apply the following Column Data Types:

<b>EmployeeID</b>	Whole Number
<b>SupervisorID</b>	Whole Number
<b>BirthDate</b>	Date
<b>HireDate</b>	Date
<b>Salary</b>	Fixed Decimal Number

e) **Apply** your step changes.

5. Once complete save the file (leaving it open as we will return back to it) and switch back to the **TRAINING TEST** report file.



## Activity: Applying Complex Steps – Pivot Column

### Tasks:

1. With the **SALES REPORT** open, select the **Transform Data** button to switch into the Power Query Editor.
2. Use the **New Source** button on the Home Tab to add the **EmployeeBenefits.xls** spreadsheet – adding **BenefitsTable**.

#### Navigator

EmployeeID	Entitlement_Days	Value
1	Holiday	20
1	LongServiceDays	0
1	Bonus	250
2	Holiday	20
2	LongServiceDays	10
2	Bonus	2500
3	Holiday	20

3. Select the **Entitlement\_Days** Column, on the Transform Ribbon Tab, select **Pivot Column** and apply the following settings:

**Pivot Column**

Use the names in column "Entitlement\_Days" to create new columns.

Values Column ①  
Value

Advanced options  
Aggregate Value Function  
Don't Aggregate

[Learn more about Pivot Column](#)

OK Cancel

Once the Pivot function has been applied, you will notice your **BenefitsTable** query will change to the following layout:

EmployeeID	Holiday	LongServiceDays	Bonus
1	20	0	250
2	20	10	2500
3	20	10	2500
4	20	10	2500
5	20	10	2500
6	20	10	2500
7	20	10	2500
8	20	10	2500
9	20	10	2500
10	20	10	2500
11	20	10	2500
12	20	10	2500
13	20	10	2500
14	20	10	2500
15	20	10	2500

4. **Apply** your changes.
5. Once complete save the file (leaving it open as we will return back to it) and switch back to the **TRAINING TEST** report file.

## Activity: Applying Complex Steps – Combine: Append

### Tasks:

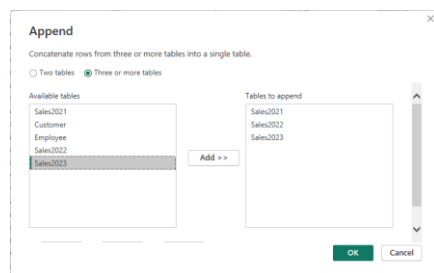
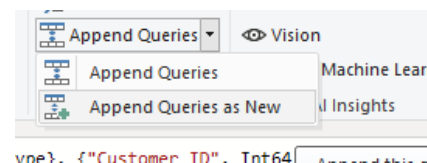
1. With the **SALES REPORT** open, select the **Transform Data** button to switch into the Power Query Editor.
2. Use the **New Source** button on the Home Tab to add the following two files:

**Sales2022.CSV**

**Sales2023.CSV**

3. Add following transformation steps to the two new queries:
  - a. Use **First Rows as Headers**
  - b. **Apply** the changes.

4. Create an **Append Queries as New** query – select the **Sales2021** query before starting and add the **Sales2022** and **Sales2023** (as shown below):

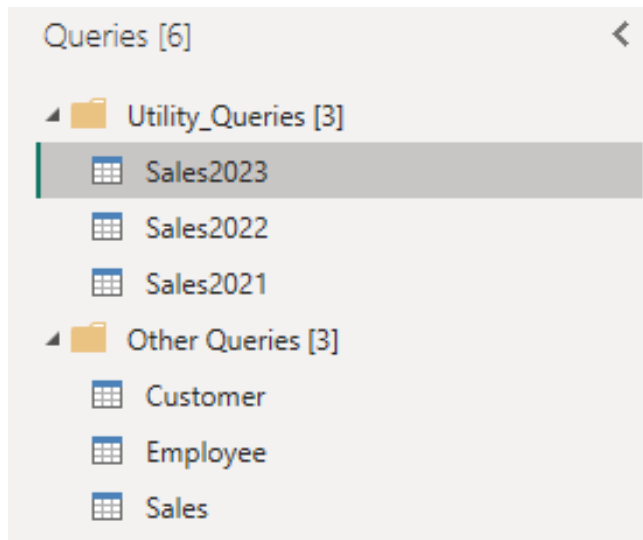


5. **Rename** the new query to be **Sales**.
  - a. Assign the following data type changes:

<b>Order_ID</b>	Whole Number
<b>Order_Amount</b>	Fixed Decimal Number
<b>Customer_ID</b>	Whole Number
<b>Employee_ID</b>	Whole Number
<b>Order_Date</b>	Date
<b>Required_Date</b>	Date
<b>Ship_Date</b>	Date

6. Add a new **Table Group** - right click in the Queries Pane and select New Group.  
Use the following settings for the new group:

7. Move the **Sales2021**, **Sales2022** and **Sales2023** into the new group.



8. **Apply** your changes.
9. Once complete save the file (leaving it open as we will return back to it) and switch back to the **TRAINING TEST** report file.

## Activity: Applying Complex Steps – Adding Columns

### Tasks:

1. With the **SALES REPORT** open, select the **Transform Data** button to switch into the Power Query Editor.
2. Within your **Sales** query, add a **Custom Column** to calculate the **Delivery\_Duration**

= [Ship\_Date] - [Order\_Date]

**Custom Column**

Add a column that is computed from the other columns.

New column name

Custom column formula ⓘ

Available columns

- Order\_ID
- Order\_Amount
- Customer\_ID
- Employee\_ID
- Order\_Date
- Required\_Date
- Ship\_Date

<< Insert

[Learn about Power Query formulas](#)

✓ No syntax errors have been detected.

OK Cancel

3. Change the datatype to be **Whole Number**.
4. **Apply** your changes.
5. Once complete save the file (leaving it open as we will return back to it) and switch back to the **TRAINING TEST** report file.

## Activity: Applying Complex Steps – Adding Conditional Columns

### Tasks:

1. With the **SALES REPORT** open, select the **Transform Data** button to switch into the Power Query Editor.
2. Within your **Sales** query, create a **Conditional Column** – name it **Delivery\_SLA**.
3. Apply the following Conditional actions:

**Add Conditional Column**

Add a conditional column that is computed from the other columns or values.

New column name  
Delivery\_SLA

	Column Name	Operator	Value	Then	Output
If	Delivery_Duration	equals	10	Then	Stage 2 Delivery
Else If	Delivery_Duration	equals	5	Then	Stage 1 Delivery

Add Clause

Else  
On Time Delivery

OK Cancel

4. **Apply** your changes.
5. Once complete save the file (leaving it open as we will return back to it) and switch back to the **TRAINING TEST** report file.

## Activity: Relating Queries

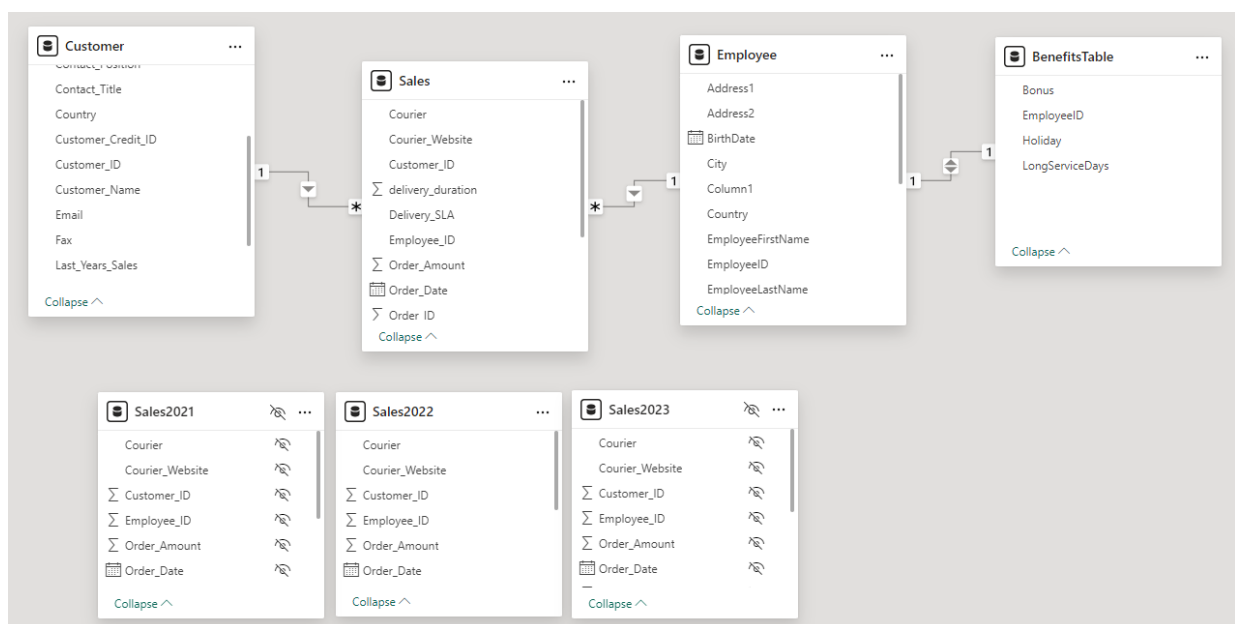
### Tasks:

1. With the **SALES REPORT** open, switch to the Model View.
2. Select the **Manage Relationships** button, **Delete** all current relationships.
3. Create the following 3 relationships:

From Table/Field	To Table/Field	Cardinality
Customer (Customer_ID)	Sales (Customer_ID)	One to Many
Employee (EmployeeID)	Sales (Employee_ID)	One to Many
Employee (EmployeeID)	BenefitsTable (EmployeeID)	One to One

4. Apply the **Hide from Report View** property to the **Sales2021, Sales2022, Sales2023** query tables.

Your view will display as follows:



5. **Apply** your changes.
6. Once complete save the file (leaving it open as we will return back to it) and switch back to the **TRAINING TEST** report file.

## Activity: Building a Page Layout Template

### Tasks:

1. With the **SALES REPORT** open, switch into the **Report View**.
2. Add a **New Page** to the Report – name it **Page Template**.



3. From the **View** ribbon tab, switch the Report to using the **Accessible Tidal** Theme.



4. Using a **Rounded Rectangle** and **Text** box, create the **Page Title** header (as shown below).
5. Add an additional Rounded Rectangle (as shown below) to fill the rest of the page.
6. From the **Insert** ribbon tab, insert the image **Xtreme Logo** found in your **PowerBI** folder, size and position to the right of your header.



7. Group all the objects together, rename them in the Selection Page to **Page Background Objects**.
8. Once complete save the file (leaving it open as we will return back to it) and switch back to the **TRAINING TEST** report file.

## Activity: Visualisations – Tables & Matrix

### Tasks:

1. With the **SALES REPORT** open, switch into the **Report View**.
2. **Duplicate** the **Page Template** page and rename the duplicated page to be **Sales Revenue by Country**.
3. Update the page title to be **Sales Revenue by Country**.
4. Add a **Matrix** visual for **Total Sales by Year** – using the following field settings:

- a) Add the **Title – Total Sales by Year**.
- b) Rename the **Sum of Order Amount** column to **YTD Total**.
- c) Practice using the **Format Shape** options to change the display of your **Matrix** as shown below.

Rows

- Country
- Region
- City
- + Add data

Columns

- Order\_Date
- Year
- + Add data

Values

- Sum of Order\_Amount
- + Add data

5. Add a **Table** visual for **Previous Year's Sales by Customer** – using the following field settings:

- a) Rename the **Last\_Years\_Sales** column to **LY Sales**.
- b) Practice using the **Format Shape** options to change the display of your **Table** as shown below.

Columns

- Customer Name
- Country
- Sum of Order\_Amount
- + Add data

6. Save your Report.

### Sales Revenue by Country



Country	2021	2022	2023	YTD Total
Argentina		£2,065.11		£2,065.11
Aruba		£5,219.55		£5,219.55
Australia	£1,799.7	£57,608.98	£6,494.04	£65,902.72
Austria		£899.85		£899.85
Bahamas		£989.55		£989.55
Bangladesh		£14.5		£14.5
Barbados		£67.8		£67.8
Belgium		£1,529.7		£1,529.7
Bermuda	£31			£31
Bolivia	£19.9			£19.9
Brazil	£9,310.03	£93,647.24	£62,000.71	£164,957.98
British Virgin Islands	£654.06	£39,151.86	£18,678.58	£58,484.5
Canada	£8,616.07	£203,796.72	£101,073.03	£313,485.82
Chile	£1,973.65	£23,353.83	£15,728.35	£41,055.83
China	£5,599.55	£36,195.96	£11,859.3	£53,654.81
Colombia		£8,819.55		£8,819.55
Costa Rica	£4,024.35	£34,333.47	£4,962.75	£43,320.57
Czech Republic	£9,487.15	£43,832.25	£6,003.34	£59,322.74
Denmark		£329.85		£329.85
Dominican Republic	£11,379.21	£40,795.79	£19,782.07	£71,957.07
Ecuador		£959.7		£959.7
Egypt		£832.35		£832.35
England	£37,977.93	£440,062.67	£142,602.27	£620,642.87
Finland		£5,879.7		£5,879.7
France	£5,240.2	£126,515.43	£24,557.87	£156,313.5
Germany	£7,114.09	£232,395.65	£66,806.63	£306,316.37
Greece		£1,664.7		£1,664.7
Hungary		£1,799.7		£1,799.7
India		£1,529.7		£1,529.7
Total	£259,390.64	£2,867,085.18	£957,189.52	£4,083,665.34

### Previous Year's Sales by Customer

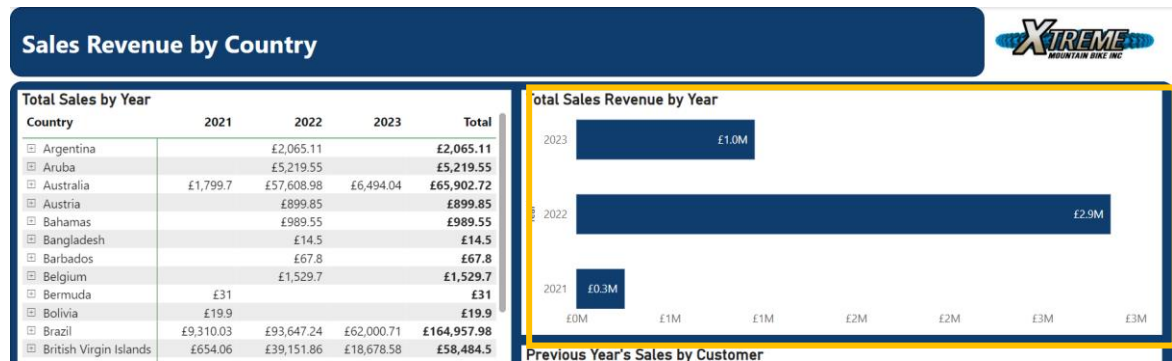
Customer Name	Country	LY Sales
Fahrkraft Räder	France	£500,000.00
BBS Pty	USA	£500,000.00
SAB Mountain	Czech Republic	£401,000.00
Tek Bikes	Germany	£301,568.22
Paris Mountain Sports	France	£300,000.00
Alley Cat Cycles	Wales	£298,356.22
Platou Sport	Australia	£201,000.00
Furia	British Virgin Islands	£201,000.00
Folk och få HB	Costa Rica	£201,000.00
Tienda de Bicicletas El Pardo	Dominican Republic	£201,000.00
Cycle City Rome	USA	£201,000.00
Magazzini	USA	£201,000.00
Piccolo	USA	£201,000.00
Belgium Bike Co.	USA	£200,000.00
Brescia Mountainers	USA	£181,444.66
Bin De Janeiro Bikers	USA	£123,551.20



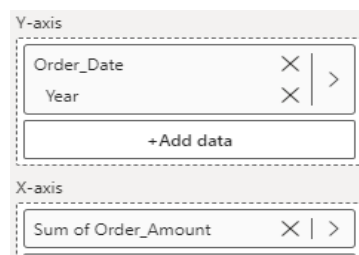
## Activity: Visualisations – Charts & Cards

### Tasks:

1. With the **SALES REPORT** open, switch into the **Report View**.
2. Add the following **Clustered Bar Chart** to your **Sales Revenue by Country** page



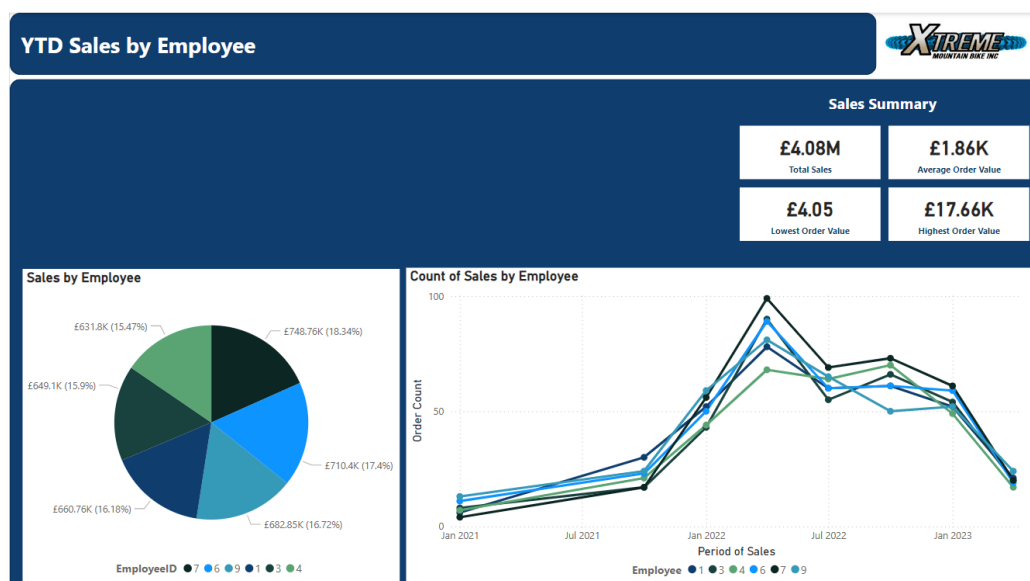
Use the following field settings:



- a) Add the **Title – Total Sales Revenue by Year**.
- b) Format the **X** and **Y Axis** settings to **Bold**. Turn off the **X Axis Title**.
- c) Switch on **Data Labels** – position **Inside End**, switch on **Optimize Label Display**, this will enhance the appearance.
- d) Update the **Bar colour**.

3. **Duplicate** the **Page Template** page and rename the duplicated page to be **YTD Sales by Employee**.
4. Practice adding **Pie**, **Line** and **Card Visuals** to create the following page layout – use the following field information:

**Sales Table – Order\_Amount, Order\_Date – Year, Quarter**  
**Employee Table – Employee\_ID**



5. Save the Report.

## Activity: Visualisations – Basic Conditional Formatting

### Tasks:

1. With the **SALES REPORT** open, switch into the **Report View**.
2. Add the following **Conditional Formatting** to your **Table** and **Matrix** on the **Sales Revenue by Country** page:

### Matrix

- a) Select the **Cell Elements** format and **Apply to Series – Sum of Order\_Amount**
- b) Select the type as **Icons**, apply the following settings.

Rules

Reverse icon order
+ New rule

If value	>=	0	Number	and	<	500	Number	then	↓	↑ ↓ ×
If value	>=	10000	Number	and	<	Max	Number	then	↑	↑ ↓ ×

The following example shows how the conditional formatting will appear:

Total Sales by Year				
Country	2021	2022	2023	YTD Total
Argentina		£2,065.11		£2,065.11
Aruba		£5,219.55		£5,219.55
Australia	£1,799.70	£57,608.98	£6,494.04	£65,902.72
Austria		£899.85		£899.85
Bahamas		£989.55		£989.55
Bangladesh		↓ £14.50		£14.50
Barbados		↓ £67.80		£67.80
Belgium		£1,529.70		£1,529.70
Bermuda	↓ £31.00			£31.00
Bolivia	↓ £19.90			£19.90
Brazil	£9,310.03	£93,647.24	£62,000.71	£164,957.98
British Virgin Islands	£654.06	£39,151.86	£18,678.58	£58,484.50
Canada	£8,616.07	↑ £203,796.72	↑ £101,073.03	£313,485.82
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China	£5,599.55	£36,195.96	£11,859.30	£53,654.81
Colombia		£8,819.55		£8,819.55
Costa Rica	£4,024.35	£34,333.47	£4,962.75	£43,320.57
Czech Republic	£9,487.15	£43,832.25	£6,003.34	£59,322.74
Denmark		↓ £329.85		£329.85
Dominican Republic	£11,379.21	£40,795.79	£19,782.07	£71,957.07
Ecuador		£959.70		£959.70
Egypt		£832.35		£832.35
England	£37,977.93	↑ £440,062.67	↑ £142,602.27	£620,642.87
Finland		£5,879.70		£5,879.70
France	£5,240.20	↑ £126,515.43	£24,557.87	£156,313.50
Germany	£7,114.09	↑ £232,395.65	£66,806.63	£306,316.37
Greece		£1,664.70		£1,664.70
Guatemala		£1,700.70		£1,700.70
Total	£259,390.64	£2,867,085.18	£957,189.52	£4,083,665.34

Activity continues on the following page....

**Table**

- Select the **Cell Elements** format and **Apply to Series – LY Sales**
- Select the type as Data Bars, apply the following settings:

Positive bar



Negative bar


☐ Show bar only

Customer Name	Country	LY Sales
Whistler Rentals	Brazil	£51,385.87
Furia	British Virgin Islands	£58,484.50
Bicicletas San Jose	Canada	£2,497.05
Biking's It Industries	Canada	£51,259.72
Blazing Bikes	Canada	£49,404.96
Cairo Bicycles, Inc.	Canada	£5,219.55
Cyclist's Trail Co.	Canada	£38,434.51
Feel Great Bikes Inc.	Canada	£43,652.86
Hooked on Helmets	Canada	£78,245.79
McDonald Klein Sports	Canada	£8,819.55
Poser Cycles	Canada	£35,908.33
Wheel to Wheel	Canada	£43.50
Warsaw Sports, Inc.	Chile	£41,055.83
Bikes, Trikes and Rollerblades	China	£959.70
<b>Total</b>		<b>£4,083,665.34</b>

- Save** your report.

## Activity : Visualisations – Working with Basic Slicers

### Tasks:

1. With the **SALES REPORT** open, switch into Report view.
2. Add the following **Slicers** to your Report:
  - a. Add a **Slicer** within the right side of your Title on the **Sales Revenue by Country** page.
  - b. Use the **Order Date – Year** field from the **Sales** table for the **Slicer**.
  - c. Change the Style of the Slicer to **Tile**.
  - d. Format the **Tiles** as follows.
  - e. Using **Edit Interactions** – make sure the **Table** visual **does not** filter with the Slicer.



- f. Add a **Slicer** to the top left side of the **Sales Revenue by Employee** page.
- g. Use the **Employee\_ID** field from the **Employee** table for the Slicer.
- h. Add the **Title – Filter by Employee**.
- i. Change the **Style** of the Slicer to **Tile**.
- j. Change the **Slicer Selection** settings to include **Show “Select All” option** and **Multi-Select with CTRL**.
- k. Format the Slicer as follows.
- l. Using **Edit Interactions** – make sure **only** the **Line Chart** filters with the Slicer.

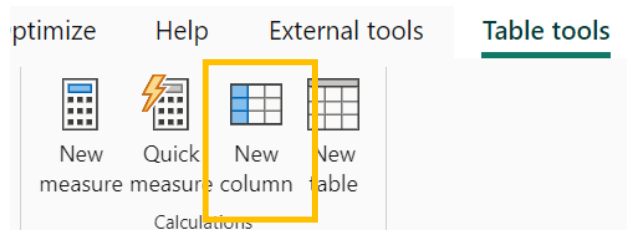


3. **Save** the Report.

## Activity: Introducing DAX Columns

### Tasks:

1. With the **SALES REPORT** open, switch to the Report editor.
2. Select the **Employee** Table within the **Data** pane.
3. Within **Table Tools** ribbon tab, select **New Column**:



4. The first column to be added, will calculate the 2.5% Salary increase based on the current **Salary** column. Use the following formula:

**Increased Salary = Employee[Salary] \* 1.025**

5. Add a second column, this will concatenate the **Firstname** and **Lastname** fields. Use the following formula:

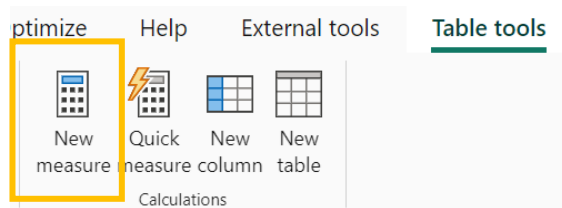
**FullName = Employee[EmployeeFirstName] & " " & Employee[EmployeeLastName]**

6. Update your **YTD Sales by Employee** page to use the new **FullName** column and not **EmployeeID** in the Chart Legends and Slicer.
7. **Save** your Report file.

## Activity: Introducing Simple DAX Measures

### Tasks:

1. With the **SALES REPORT** open, switch to the Report editor.
2. Select the **Sales** Table within the **Data** pane.
3. Within **Table Tools** ribbon tab, select **New Measure**:



4. The first **Measure** will Calculate the **Average of Revenue at 5%**. Use the following formula:

**Avg Revenue Split (5%) =**  
**AVERAGE (Sales[Order\_Amount]) \* 0.05**

5. Create a second **Measure**, this will be a static value for our **Target** to be used in a KPI. Use the following formula:

**Target = 150000**

6. **Save** your Report file.

## Activity: Visualisations – KPI's

### Tasks:

1. With the **SALES REPORT** open, switch into **Report** view.
2. Switch to your **Sales Revenue by Employee** page.
3. Add a KPI visual to the page, using the following settings:

Value

Sum of Order\_Amount

Trend axis

Order\_Date

Year

Target

Target

+Add data

4. Add a **Title** to the KPI – **Employee Performance against Target**.
5. Format the **KPI** as shown below.
6. **Save** the Report.

