Week 5 – Business Analytics Fundamentals – Sydney Campus

1. Review of Lecture 4
2. Mastering Concepts for Tutorial Week 5
3. Tutorial Week 5 – step-by-step instruction
4. Attendance & Tutorial Questions - Recognising student participation and engagement specifically identifying those who are most actively involved!

Lecturer/Tutor: Dr. Farshid Keivanian

1. Summary of Lecture 4

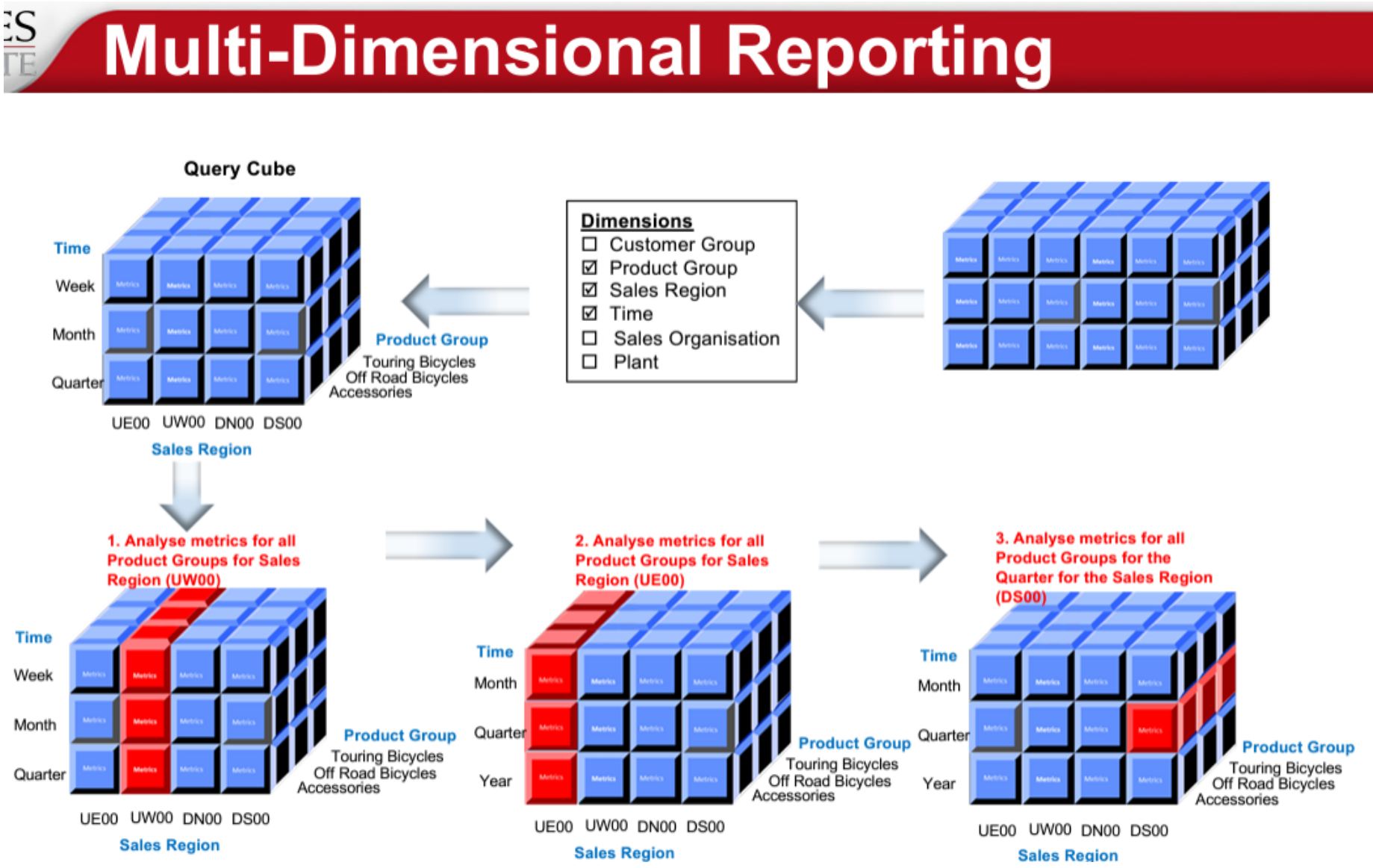
Lecture 4 delves into various analytical tools and techniques crucial for business decision-making. It emphasizes the importance of both proactive and reactive decision-making approaches and categorizes different types of reporting tools used in business intelligence. The lecture also provides a fundamental understanding of SQL and its applications in retrieving and manipulating database information effectively.

1. Summary of Lecture 4

A practical example of these concepts in an Australian context might involve a retail company using multi-dimensional reporting to analyze sales data across different regions and product categories. For instance, a company like Woolworths could utilize OLAP systems to segment sales data by product type, store location, and time period. This could help them understand seasonal trends, customer preferences, and regional sales performance. By applying predictive analytics, Woolworths could forecast future sales and optimize stock levels accordingly, thereby making informed, proactive business decisions that enhance profitability and customer satisfaction in the competitive Australian market.

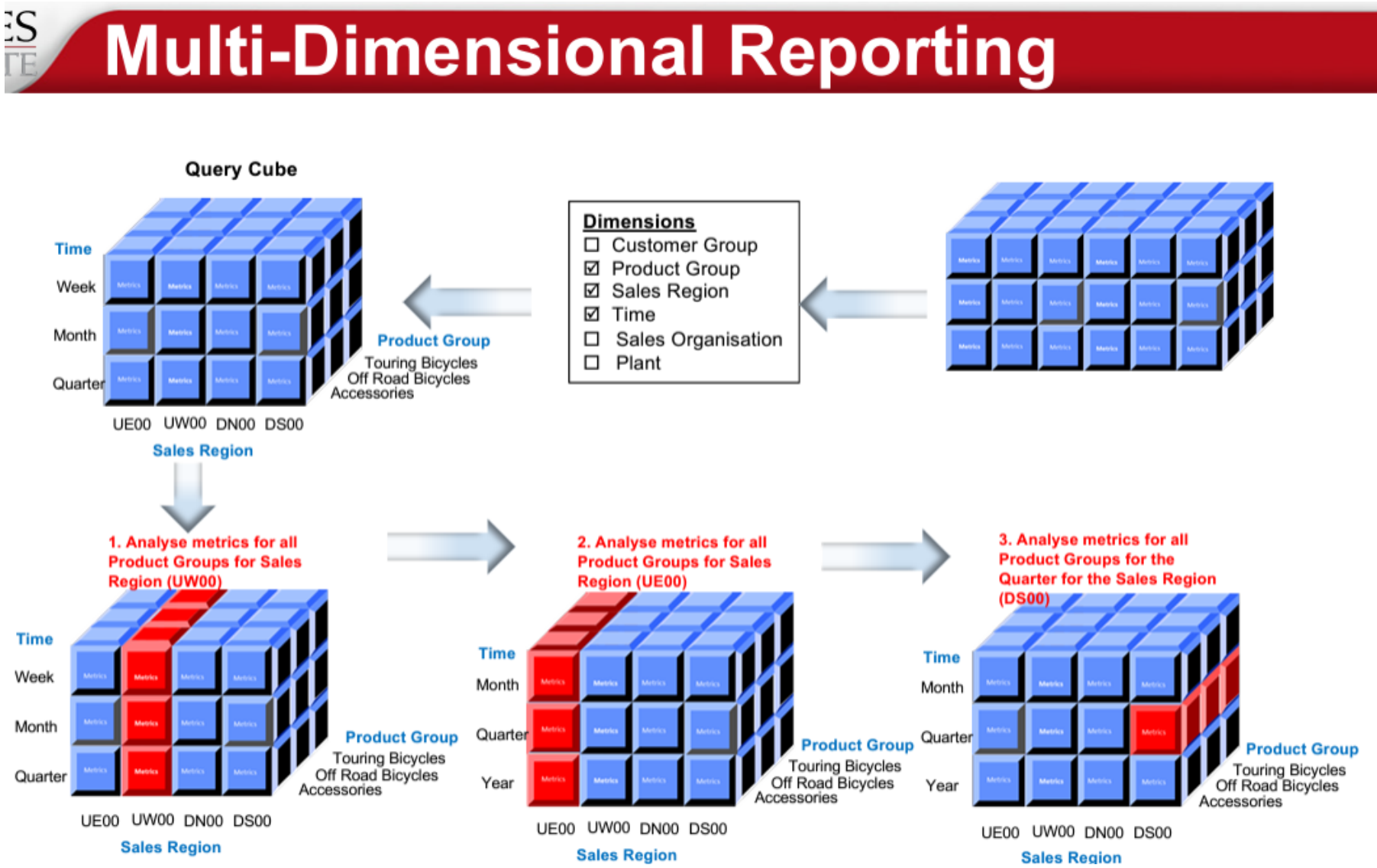
1. Summary of Lecture 4

This a visual representation of multi-dimensional reporting in a business context, particularly related to sales data. It shows how data can be analyzed using different dimensions within a data cube, a common concept in business intelligence and data analysis.



Query Cube:

This is the main cube in the center, with multiple smaller cubes, each representing a data point. It's labeled with different dimensions: Time (Week, Month, Quarter), Product Group (Touring Bicycles, Off Road Bicycles, Accessories), and Sales Region (indicated by codes like UE00, UW00, DN00, DS00).

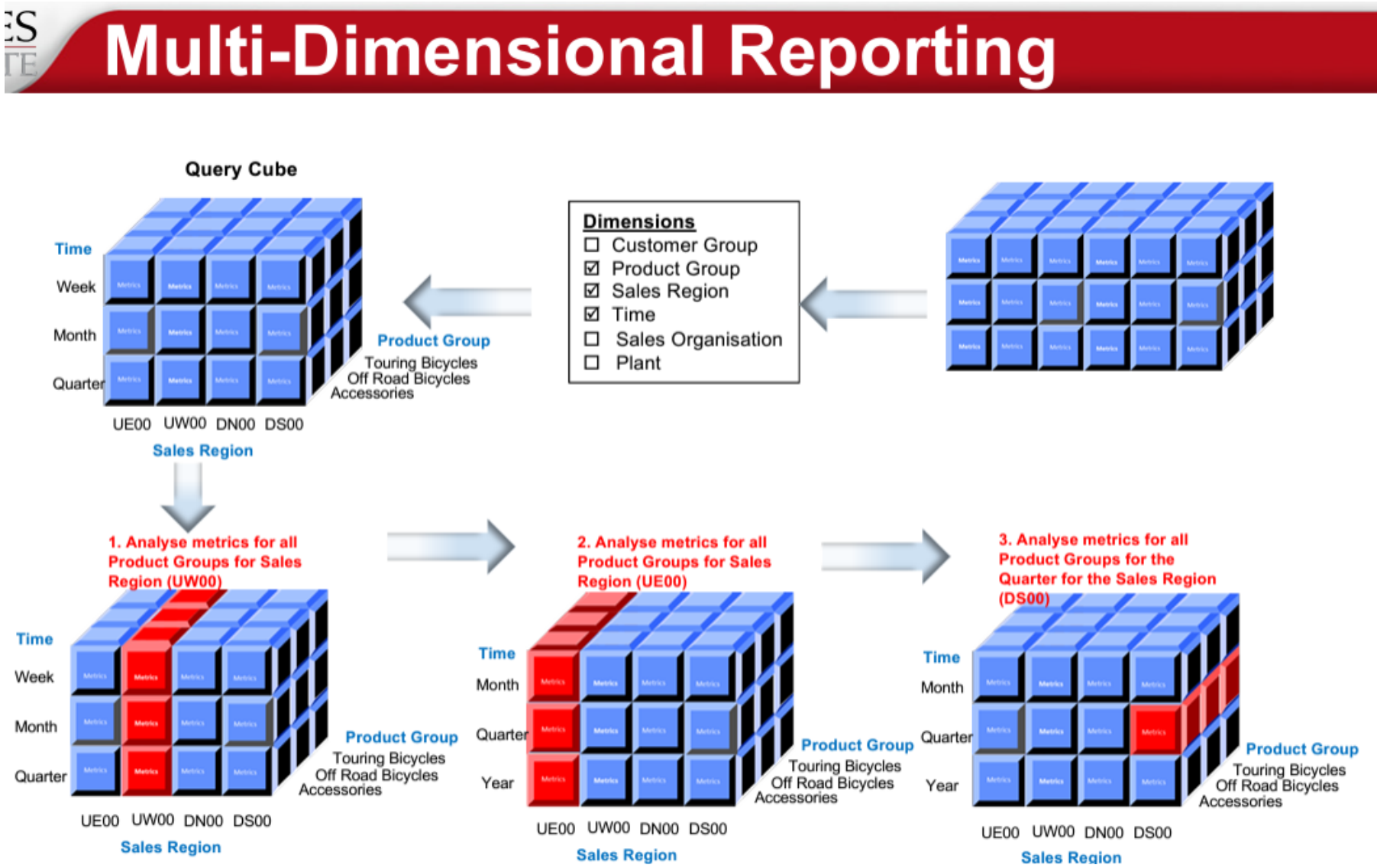


1. Summary of Lecture 4

Dimensions:

To the right of the main cube, there's a list of possible dimensions that can be selected for analysis:

- Customer Group
- Product Group
- Sales Region
- Time
- Sales Organisation
- Plant

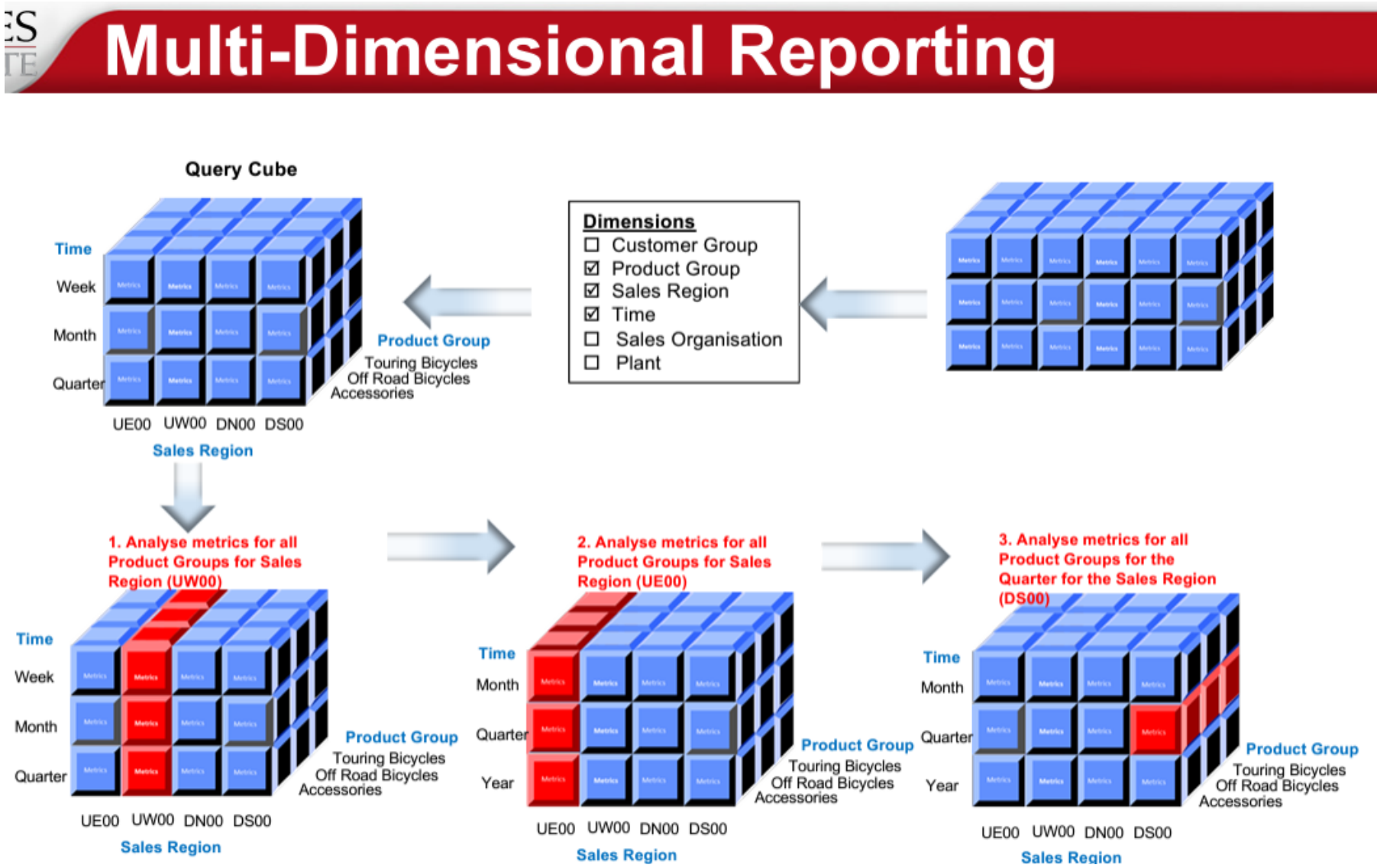


1. Summary of Lecture 4

Some of these are checked, indicating that they have been selected for the current view or analysis.

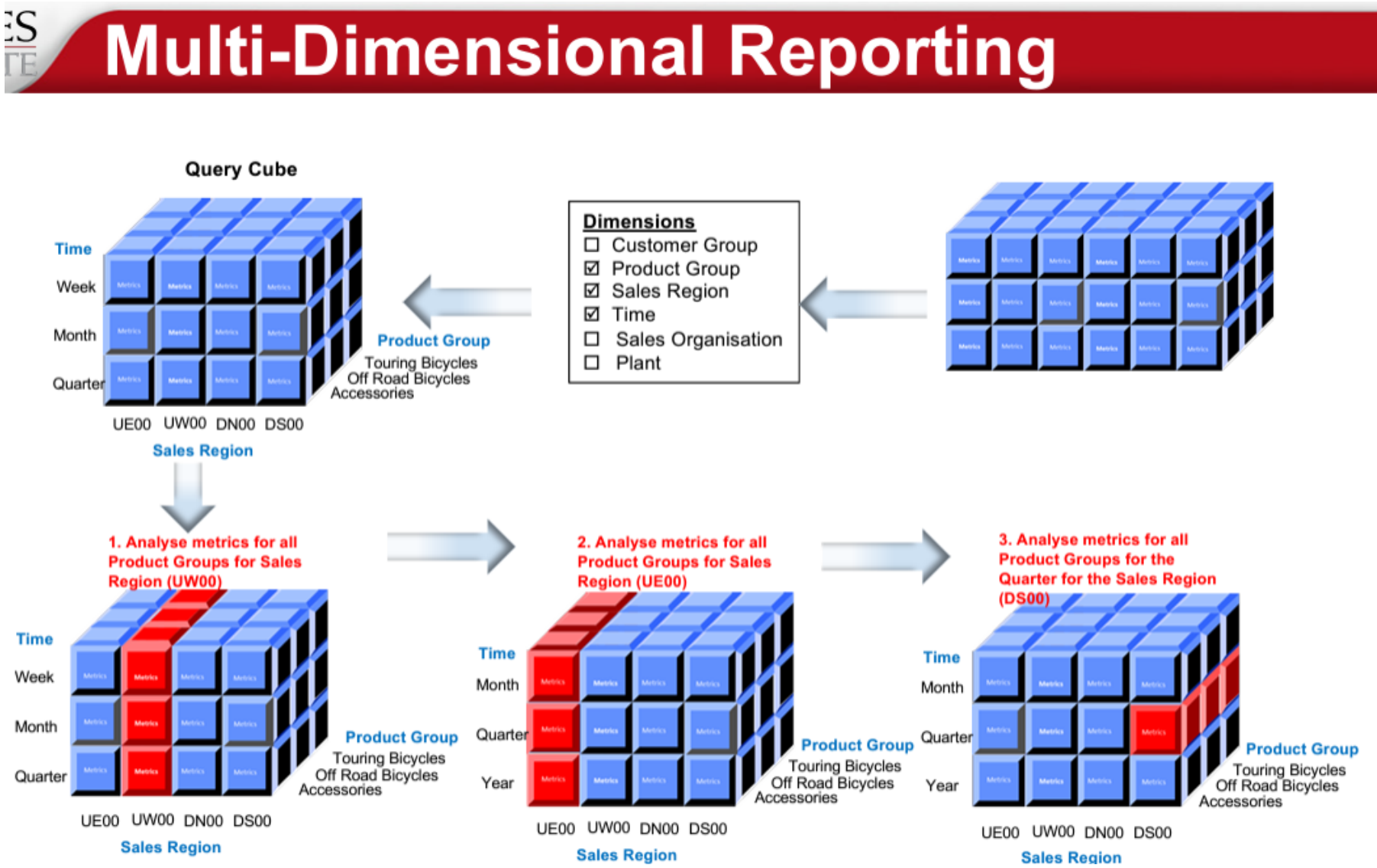
Multi-Dimensional Reporting:

The figure illustrates three different ways to analyze sales metrics based on the selected dimensions:



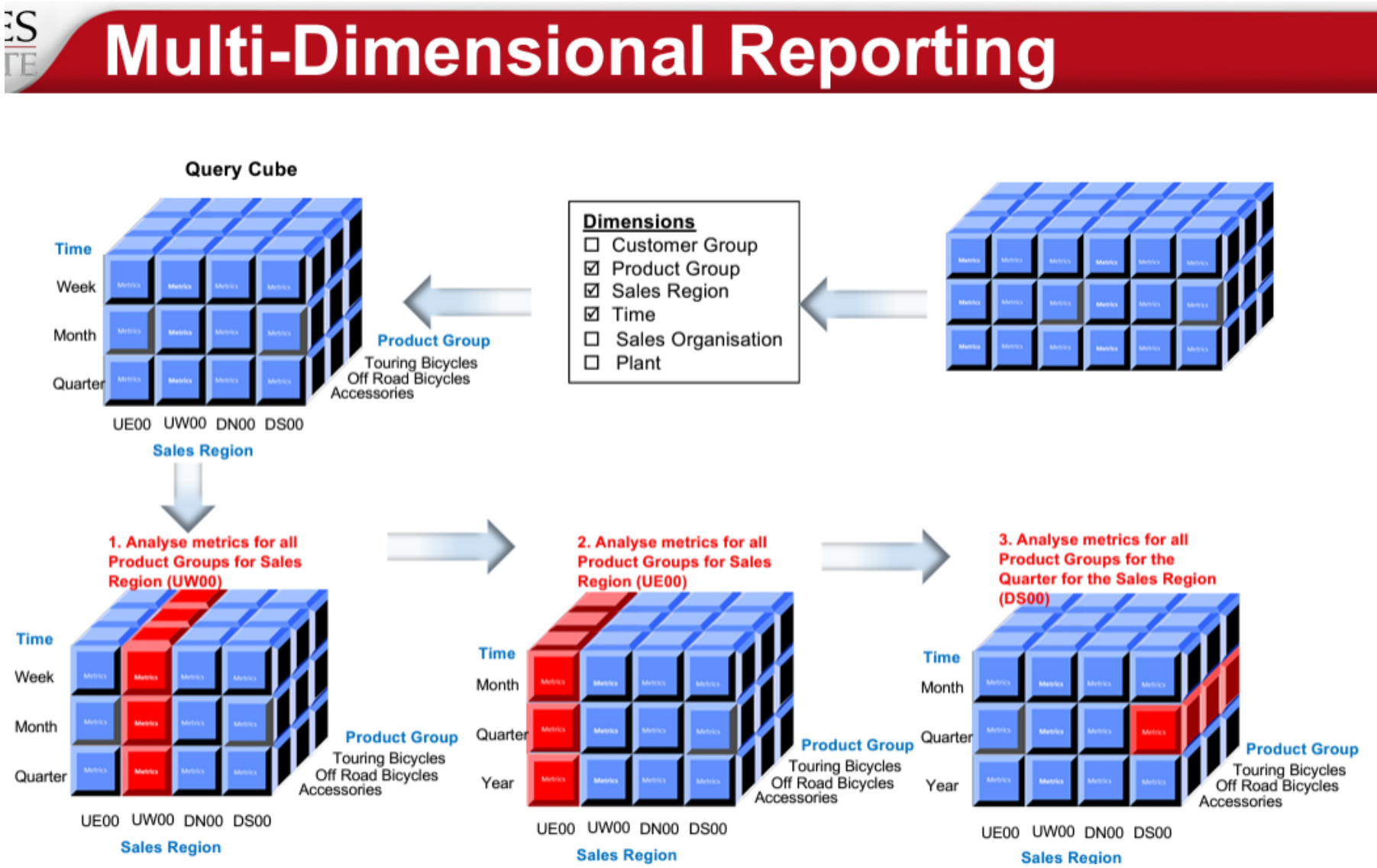
1. Summary of Lecture 4

1. Analyse metrics for all Product Groups for Sales Region (UW00): This shows a slice of the cube where one specific sales region (UW00) is selected, and all product groups and time periods are included. It's like looking at one flat layer across the entire cube, focused on one region.



1. Summary of Lecture 4

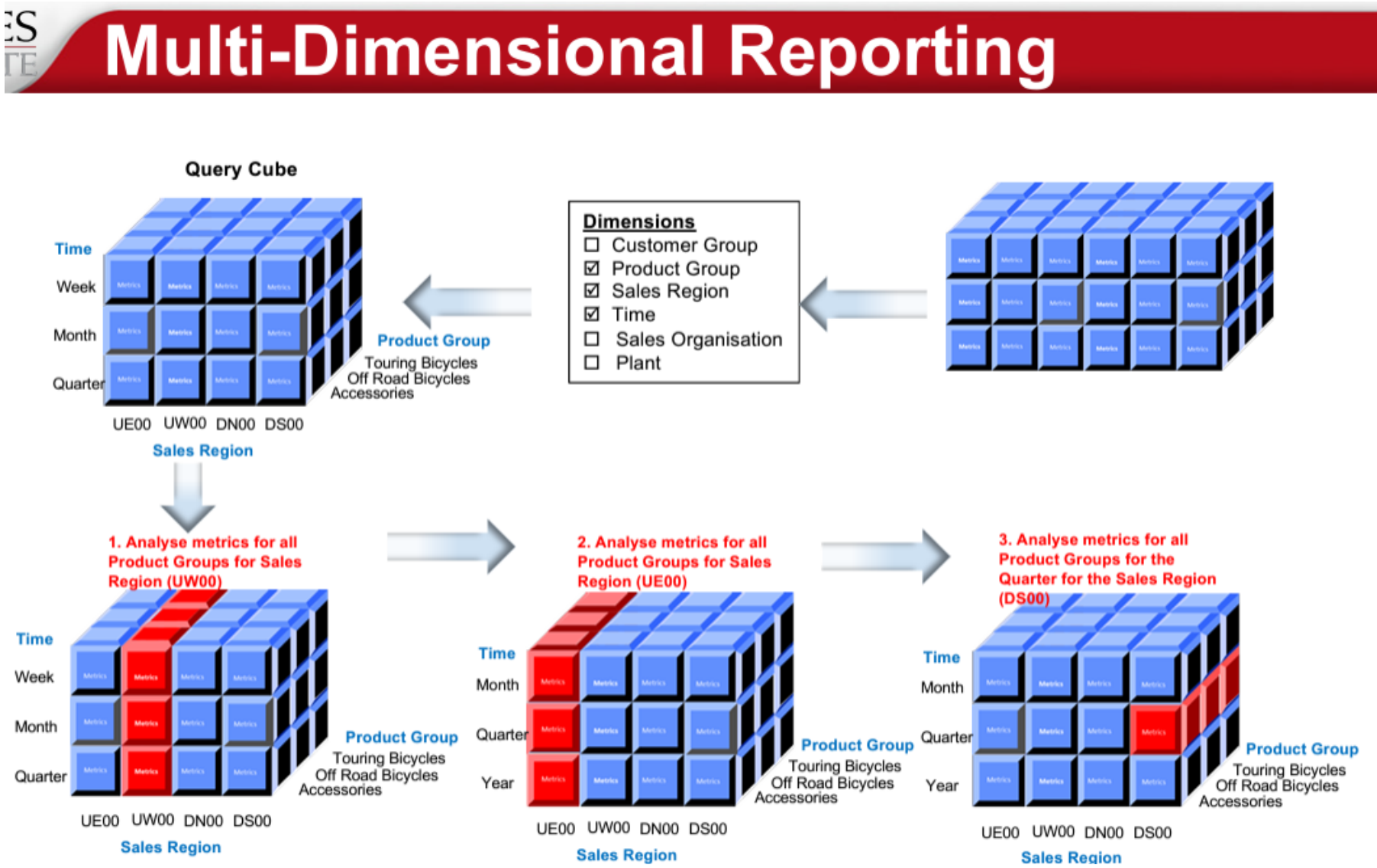
2. Analyse metrics for all Product Groups for Sales Region (UE00): This view seems to provide a more drilled-down analysis. It's not just one slice; it's like looking at one end of the cube, where a single sales region (UE00) is selected, but the metrics are analyzed across all time periods and product groups.



1. Summary of Lecture 4

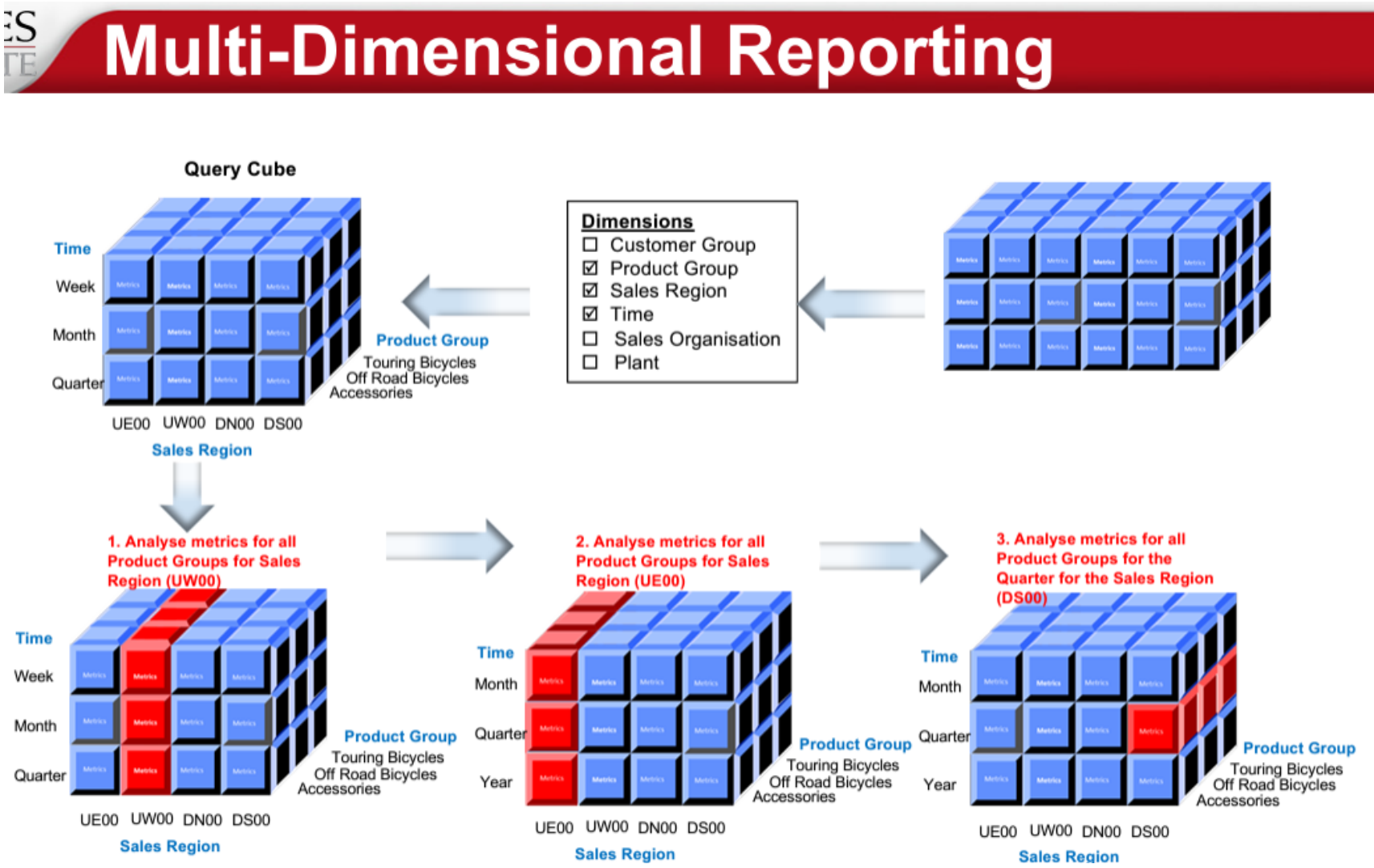
3. Analyse metrics for all Product Groups for the Quarter for the Sales Region (DS00):

This is an even more specific analysis, focusing on a particular quarter for one sales region (DS00). Here, the cube is filtered to show only the data relevant to that quarter, region, and all product groups.



The colours visually segregate the data to highlight the segments being analysed.

In essence, the figure is showing how a business can filter and slice its data to analyze it from different angles using a multi-dimensional data structure, which is very helpful for uncovering trends and insights that are not apparent when looking at standard flat data tables.



2. Mastering Concepts for tutorial week 5

1. **Data Visualization:** Understanding the representation of data in graphical format, which helps to easily identify patterns, trends, and outliers in large data sets.
2. **Basic Statistics and Business Metrics:** Knowledge of business metrics such as profit, sales, and growth, and how they can be derived and used in business analytics.
3. **Data Transformation and Querying:** Skills in transforming raw data into a more useful format using Power Query Editor, including filtering, sorting, and adding new calculated columns.
4. **Dimensional Modeling:** Familiarity with the concept of dimensions in data, such as time (year, quarter, month), product categories, and geographical regions, which are used to slice the data for analysis.

2. Mastering Concepts for tutorial week 5

5. **Hierarchies and Drill-down Analysis:** Understanding how to navigate through data using hierarchies (e.g., from year to quarter to month) and perform a drill-down analysis to uncover detailed insights at each level.
6. **Interactive Dashboards and Reports:** Ability to create and manipulate interactive dashboards and reports that enable end-users to explore data in a self-service manner.
7. **Cross-filtering and Highlighting:** Knowledge of how selecting a data point in one visualization can affect other visualizations on a report page, allowing for an interactive analysis experience.

2. Mastering Concepts for tutorial week 5

8. **Power BI Interface and Basic Operations:** Familiarity with the Power BI Desktop interface, including how to add visualizations, configure properties, and import data.
9. **Data Sources and Connectivity:** Understanding of different data sources and how Power BI can connect to them (e.g., databases, spreadsheets, web services).

2. Mastering Concepts for tutorial week 5

Some Practical Examples in Australia)

1. Sales Analysis for an Australian Retail Chain: Analyze sales data by region (e.g., Victoria, New South Wales), product category (e.g., clothing, electronics), and time (e.g., monthly, quarterly).

2. Tourism Analysis: Explore tourism data to visualize the number of visitors to landmarks like the Sydney Opera House or Uluru over time and by visitor origin.

3. Energy Consumption Dashboard: Create a dashboard for an Australian energy company to monitor consumption patterns across different states and time periods.

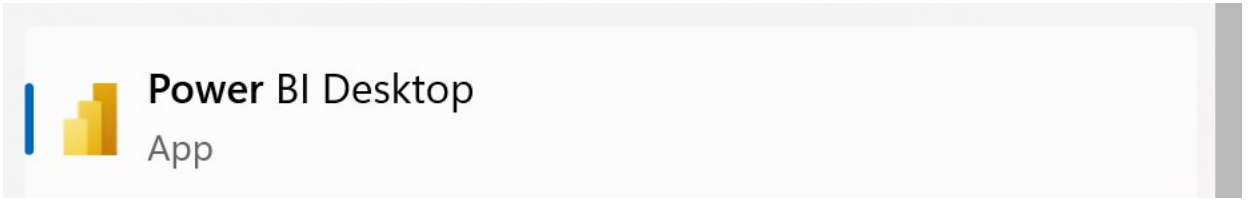
4. Healthcare Data Reporting: Visualize healthcare data, such as patient visits or hospital performance metrics, by state and type of service (e.g., emergency, elective surgery).

5. Australian Sports Performance Analysis: Analyze sports data, such as AFL or cricket match statistics, to find trends in player performances or team rankings.

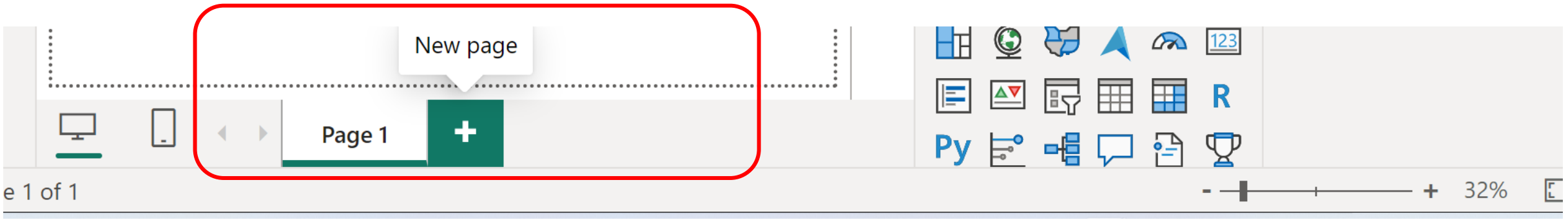
6. Real Estate Market Trends: Explore real estate sales data to visualize trends in property prices, sales volume, and time on market across different Australian cities.

3. Tutorial week 5 – Report Visualisation

You have been asked to create a report with a number of visualisations related Uluru sales at different times of the year.



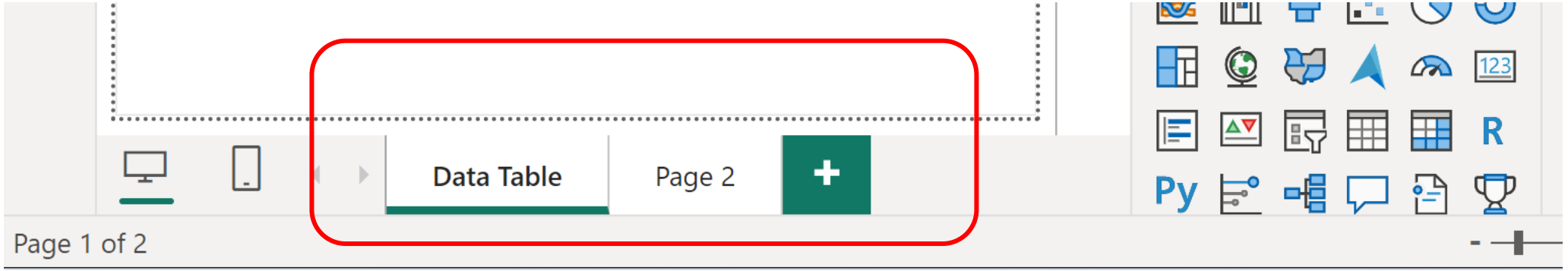
- **Run** Power BI Desktop
- **Open** 'Tutor Week 4.pbix'
- **Select** + to add a New page



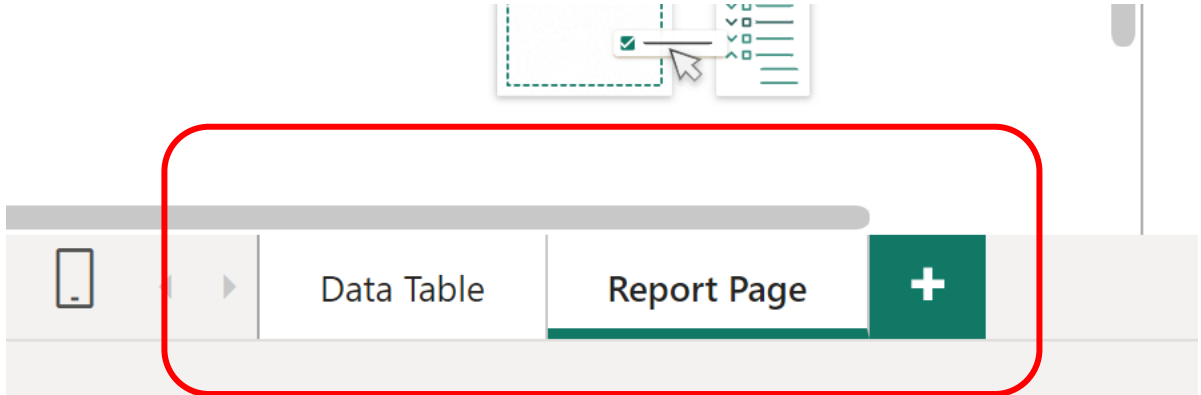
You now have two pages in your report.

3. Tutorial week 5 – Report Visualisation

- **Double Click** Page 1 to highlight it and then rename it
- **Rename** Page 1 → Data Table



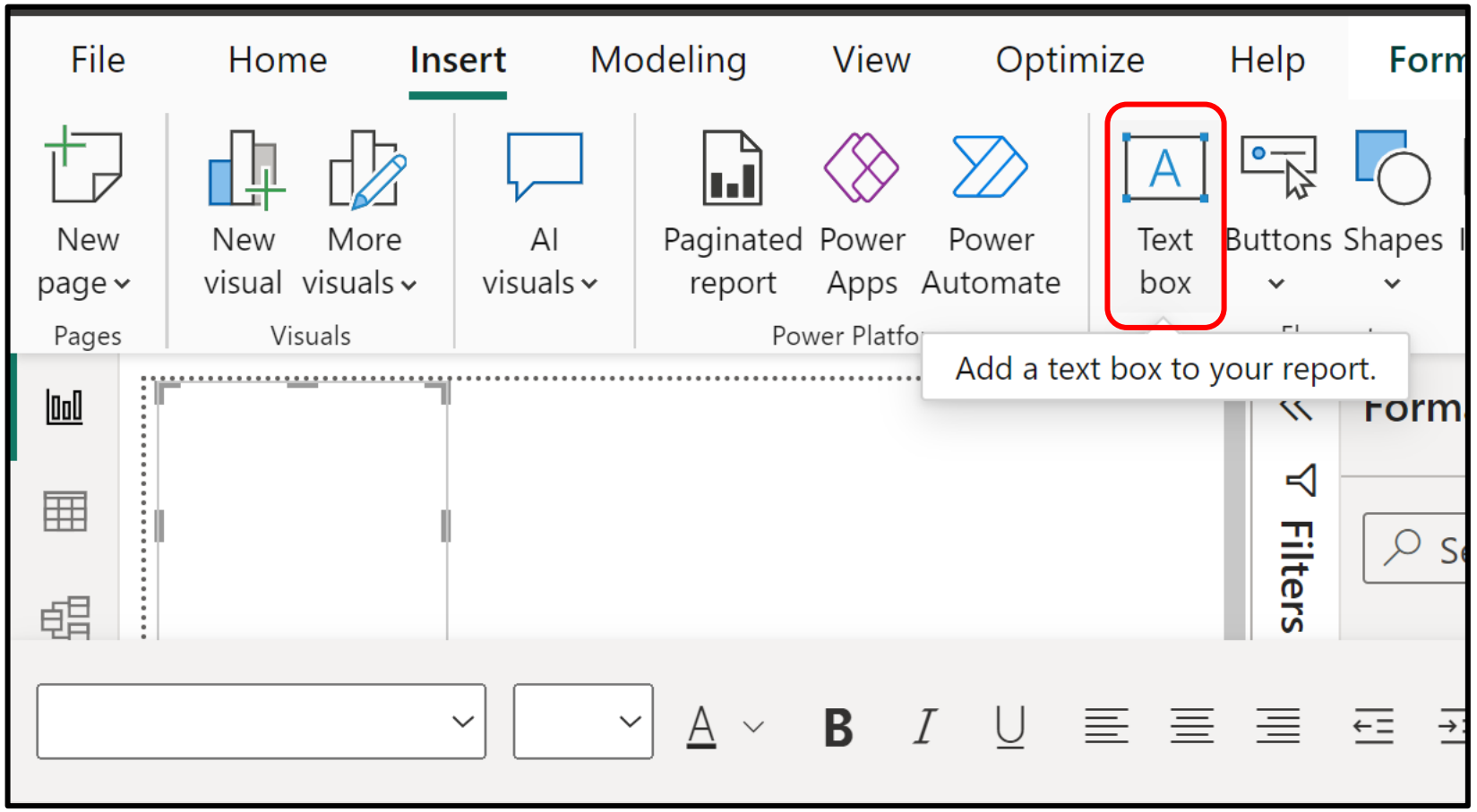
- **Double Click** Page 2 to highlight it and then rename it
- **Rename** Page 2 → Report Page



3. Tutorial week 5 – Inserting Text

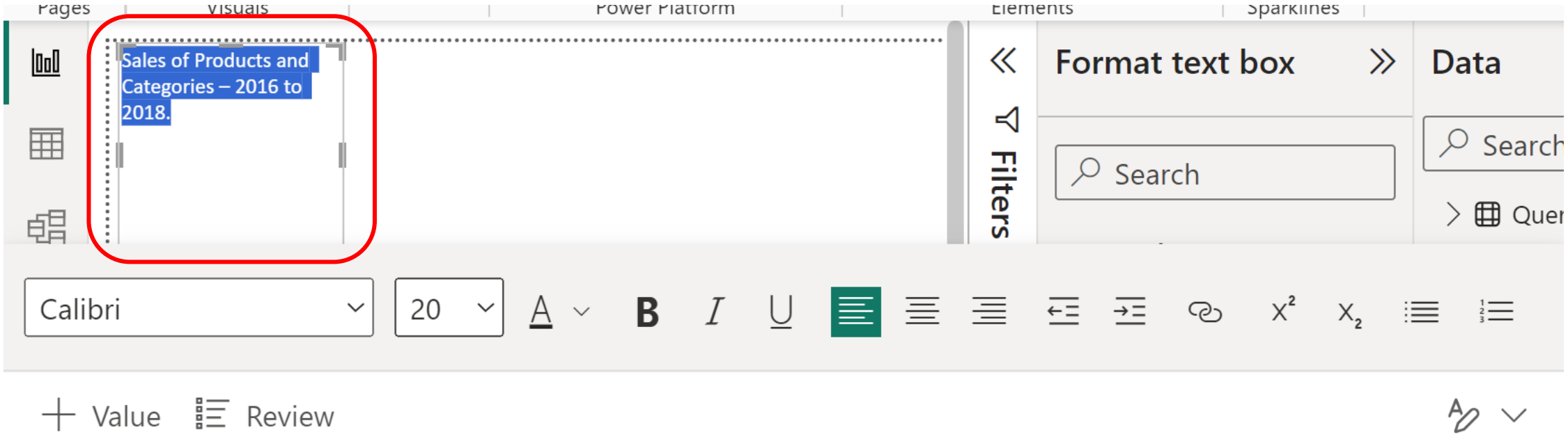
Each report you create should have a meaningful title so that users can understand the purpose of the report at first glance

- **From the Menu Insert**
- **Select** Text box



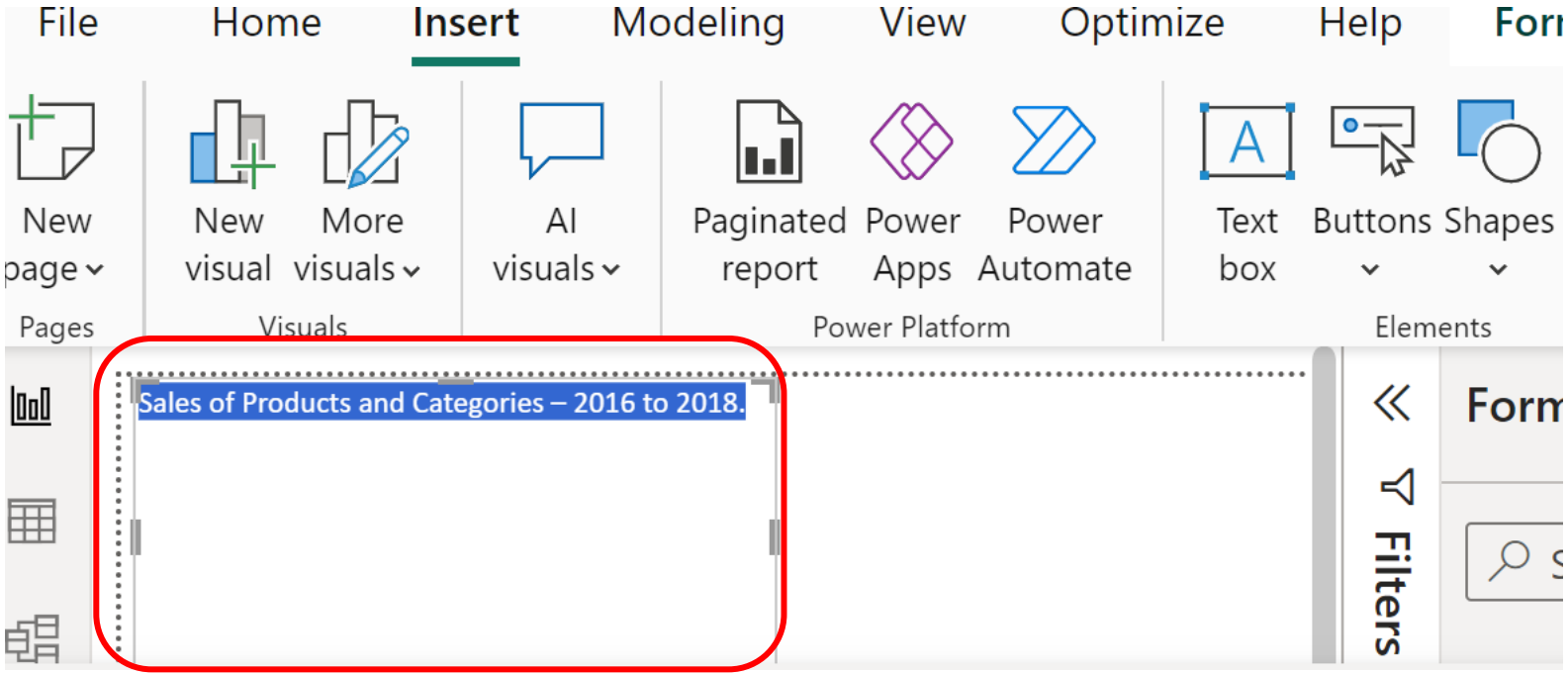
3. Tutorial week 5 – Inserting Text

- **Type** Sales of Products and Categories – 2016 to 2018.
- **Size** 20 and **Bold**



3. Tutorial week 5 – Inserting Text

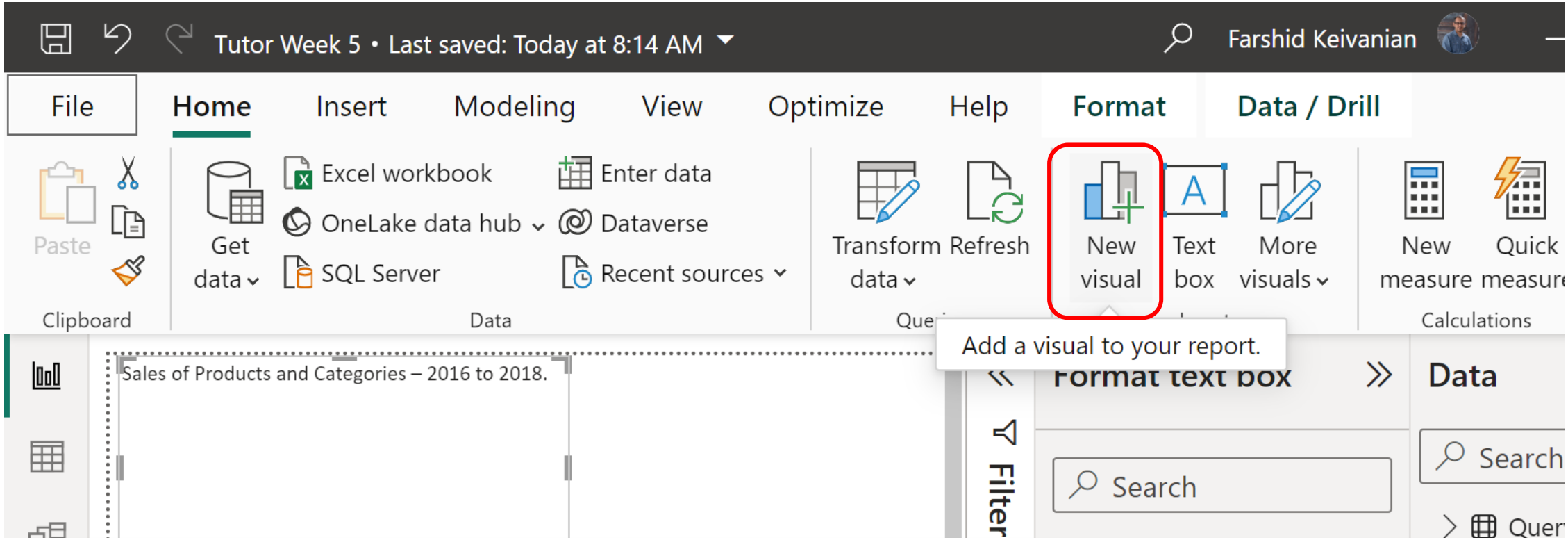
- **Resize** the Text Box so that it is appropriate for the report title



3. Tutorial week 5 – Creating Visualisation

The first step in creating a visualisation is to place a visualisation placeholder on your page. This placeholder can be edited to change the type of visualisation displayed.

- **From the** Home **Menu**
- **Select** New Visual



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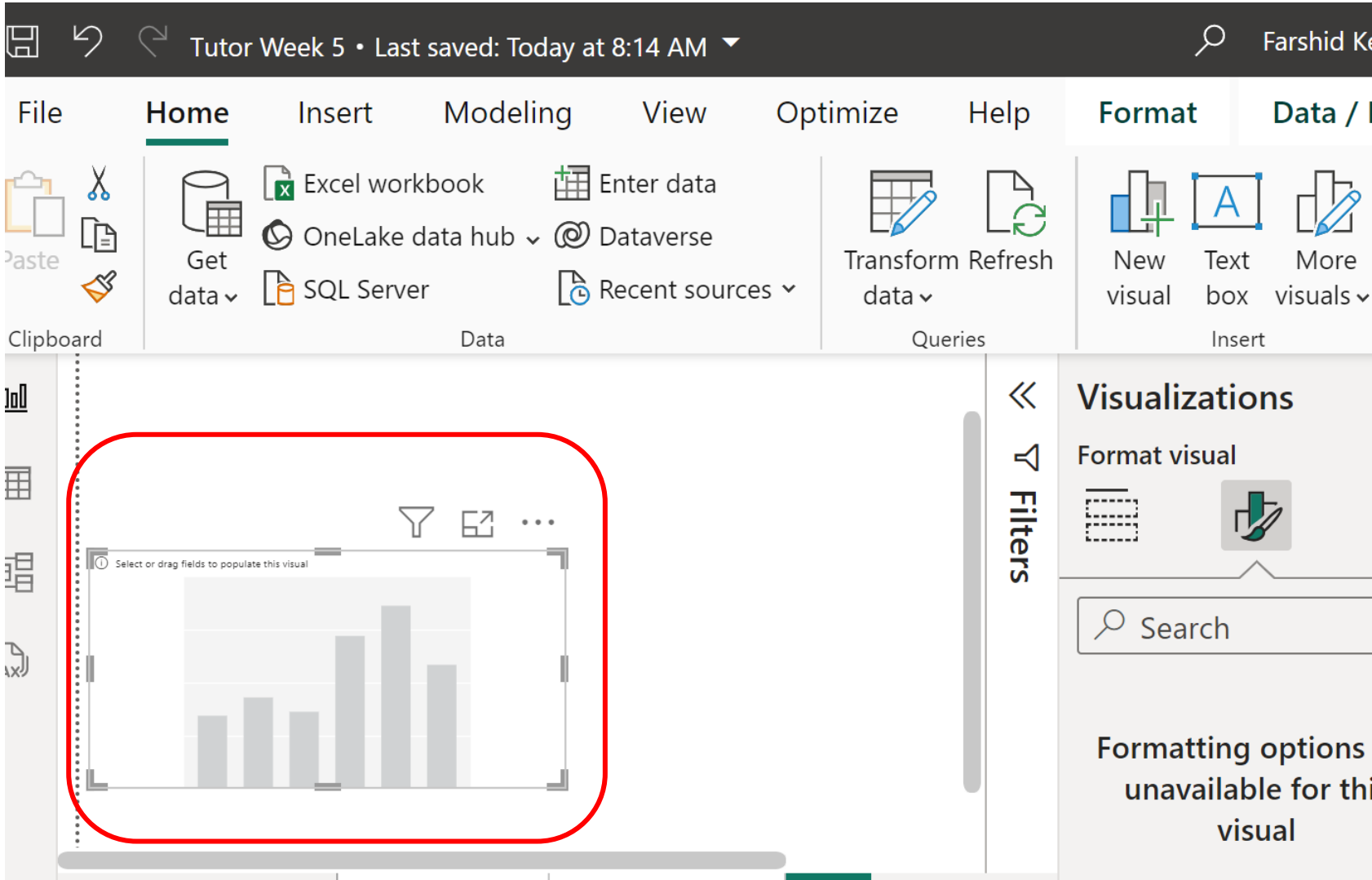
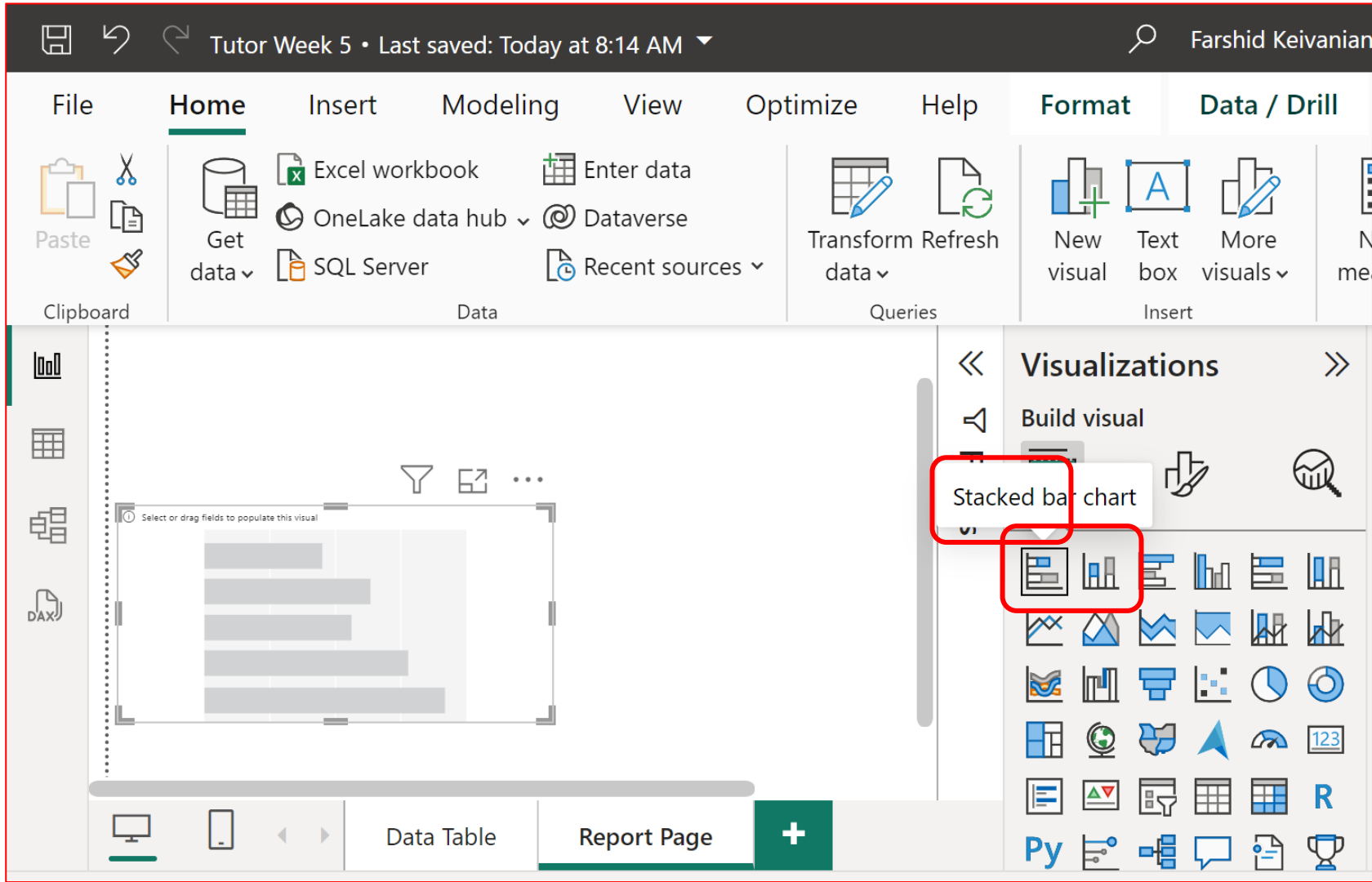


3. Tutorial week 5 – Changing Visualisation Placeholder

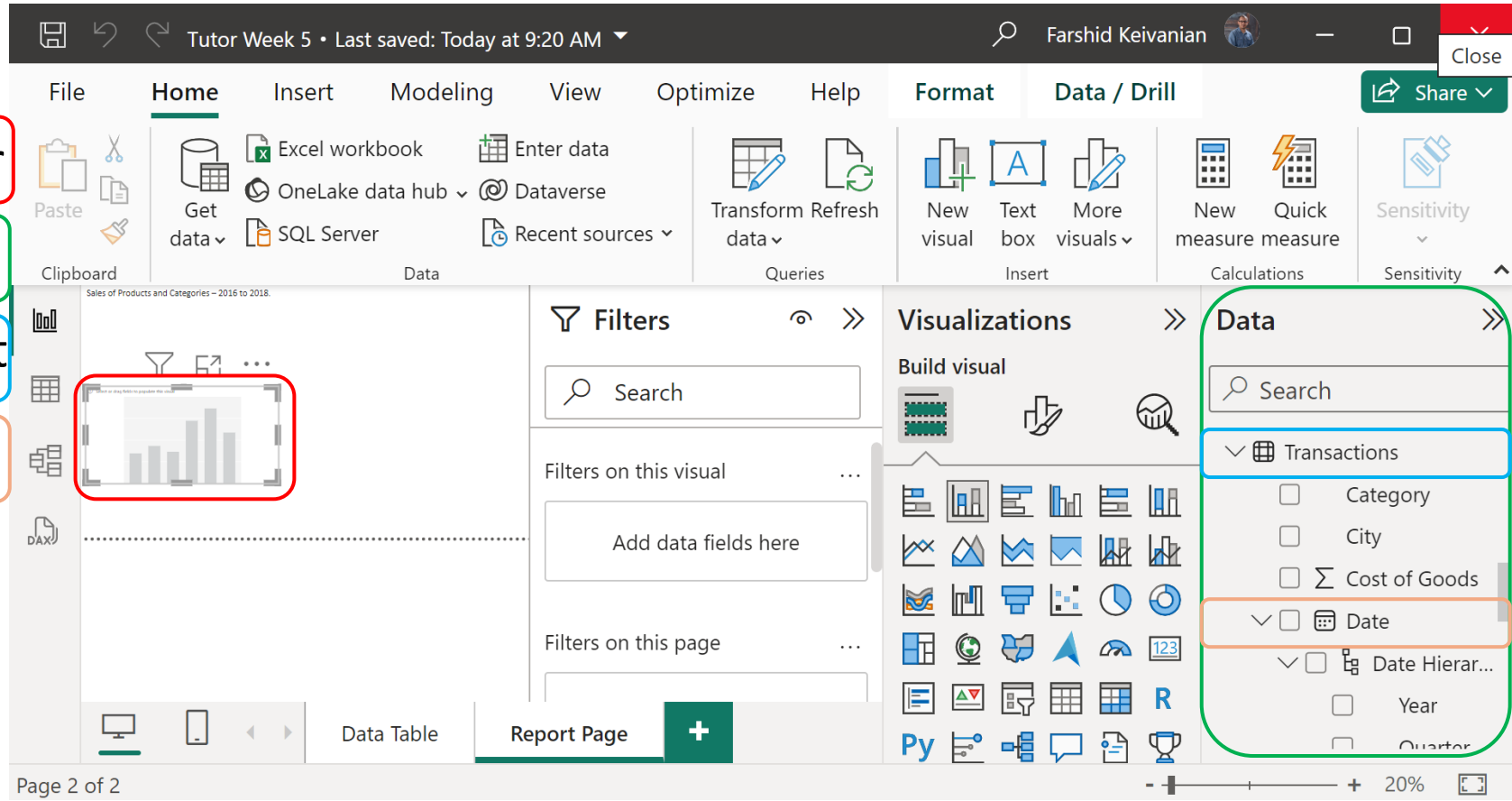
- **Click on** Stacked bar chart from Visualisations
- **Click on** Stacked column chart from Visualisations



3. Tutorial week 5 – Adding Data to the Visualisation

Currently you have inserted a visualisation placeholder to your report but it contains no data. There are a number of ways you can easily add data to your chart. One way is to add fields from the Fields Pane to the relevant areas of the chart in the Visualisation Pane

- **Select** Report Page
- **Click** on Visualization Placeholder
- **Click** on Data Pane (right side)
- **Click** on Transactions to **Expand** it
- **Click** on Date to **Expand it**



(The Date field has a number of attributes that are arranged in a Hierarchy.) PowerBi has built this Hierarchy automatically based on the Date Field. It enables the user to use and navigate the data by any of the associated attributes (Year, Quarter, Month, Day)

3. Tutorial week 5 – Adding Data to the Visualisation

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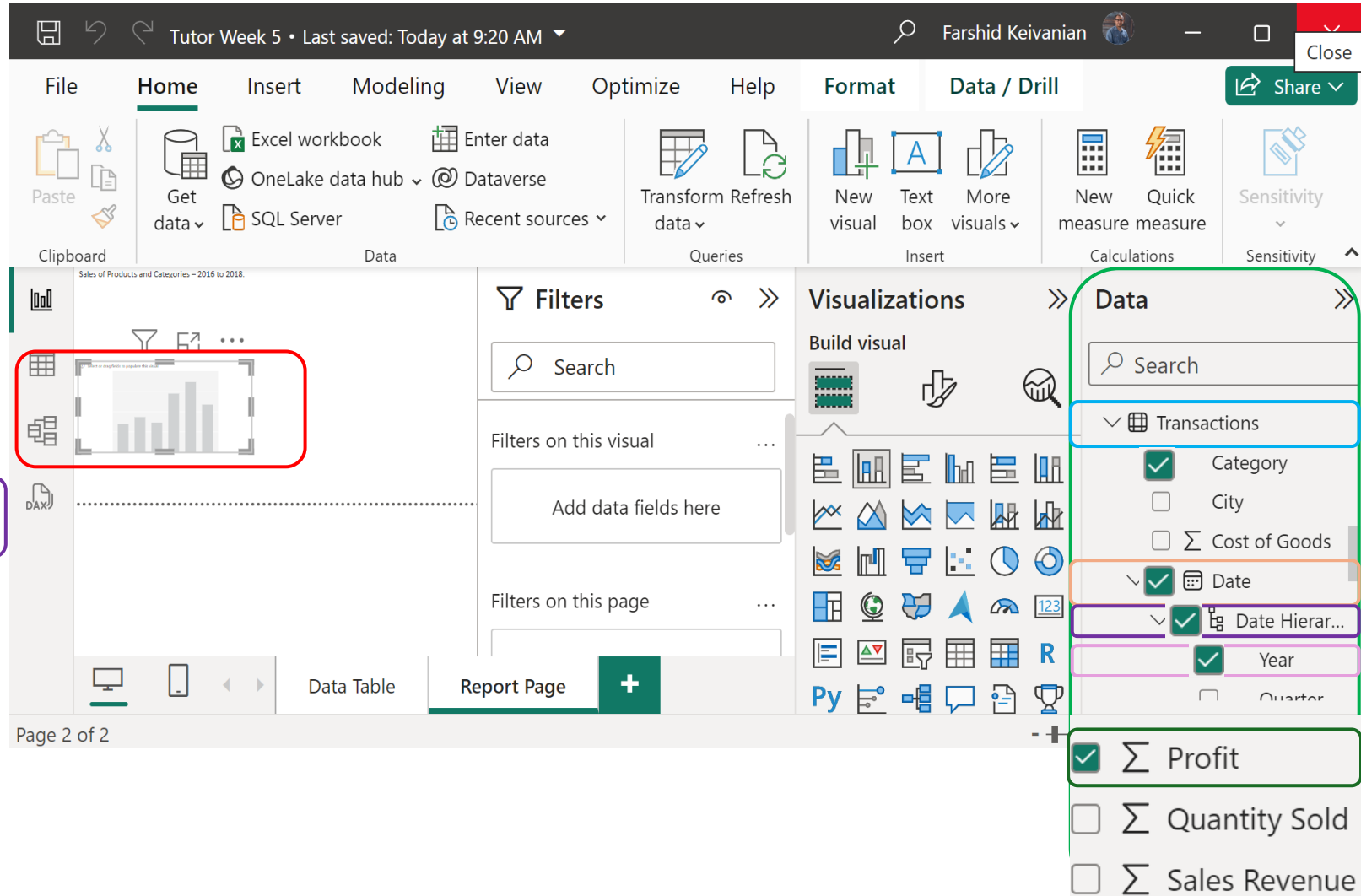
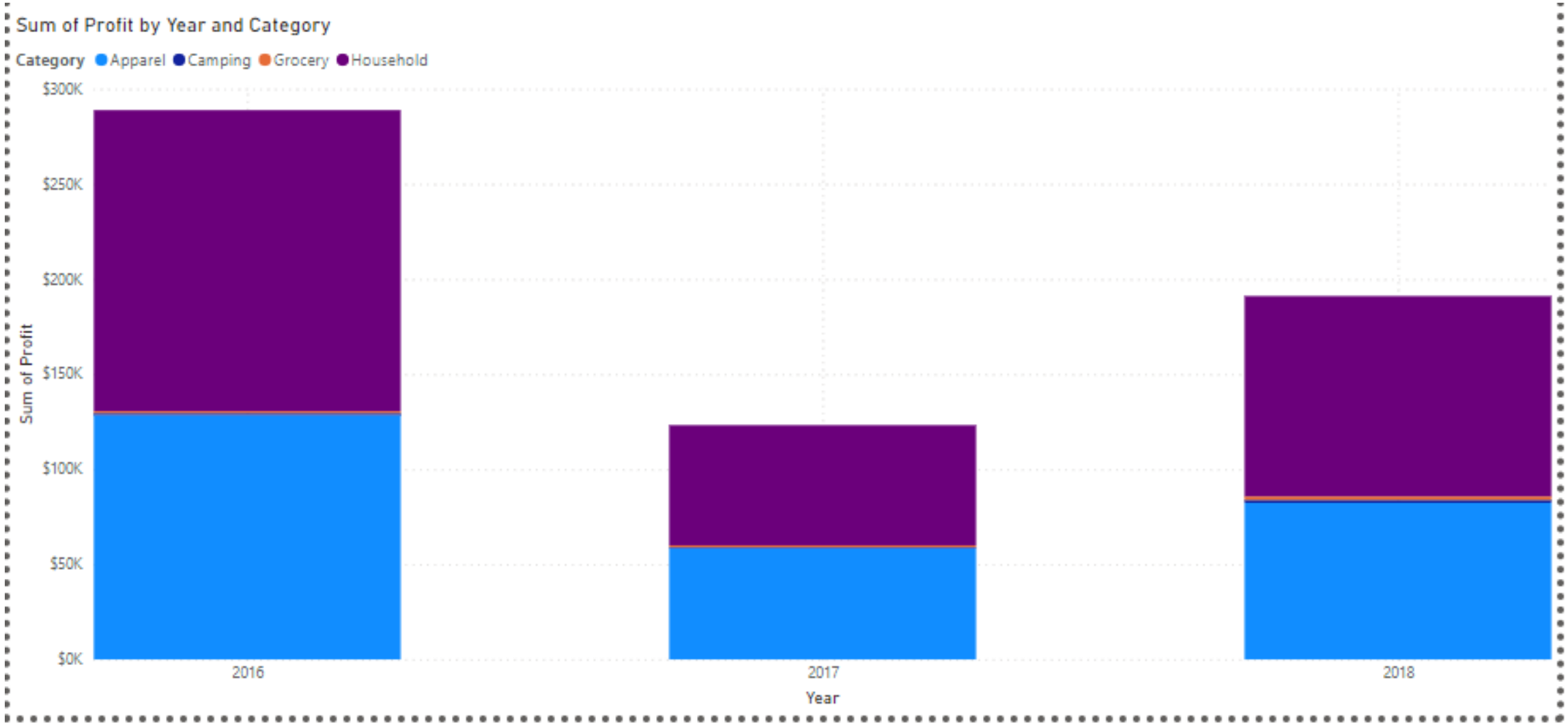
- **Select** Report Page
- **Click** on Visualization Placeholder
- **Click** on Data Pane (right side)
- **Click** on Transactions to **Expand** it
- **Click** on Date to **Expand it**
- **Click** on Date Hierarchy to **Expand** it
- **Select** Year
- **Select** Category and Profit



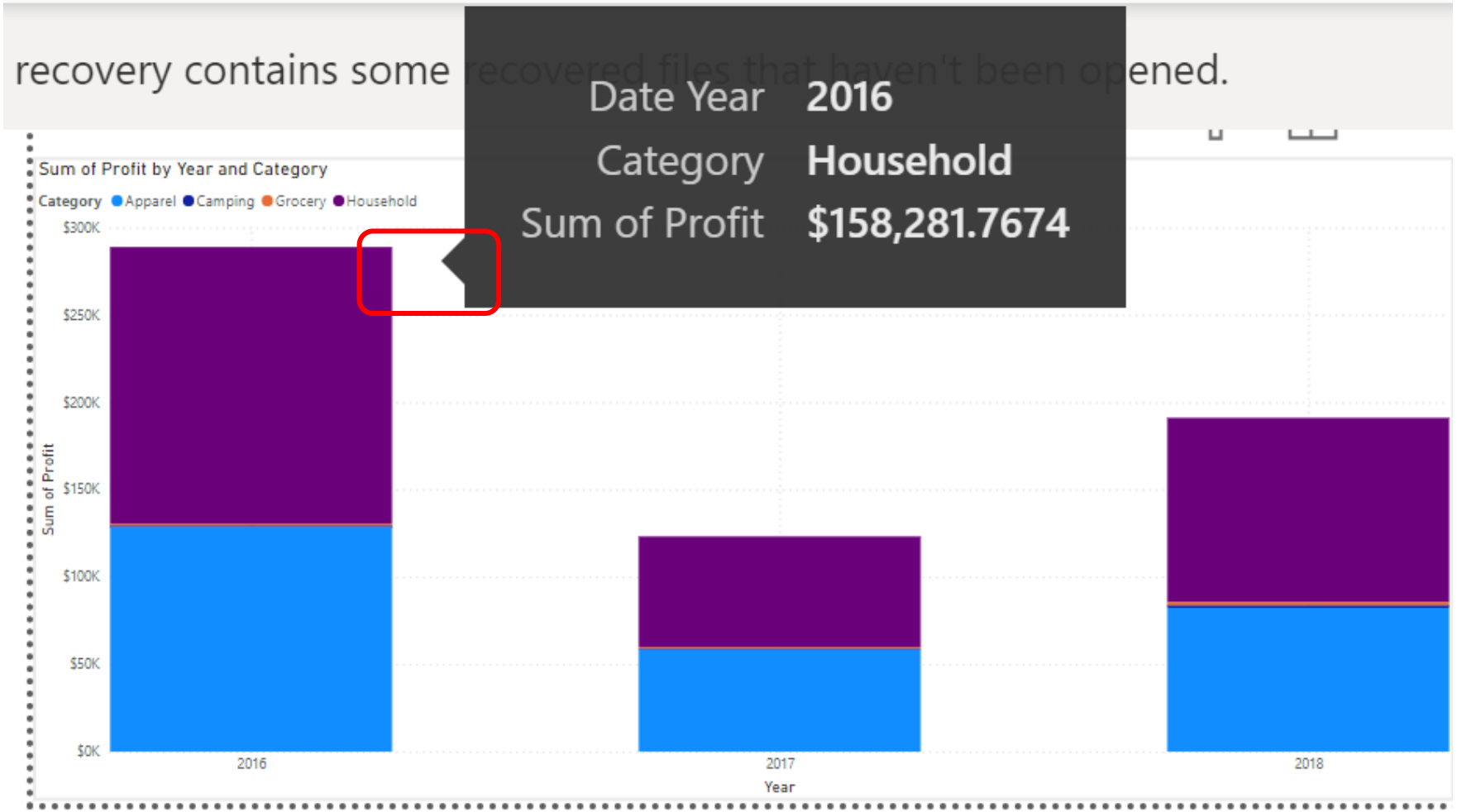
3. Tutorial week 5 – Chart and Adjusting the Scaling

- **Collapse** Visualisations and Data Pane
- **Drag the handles to Resize** the Chart and adjust the scaling accordingly



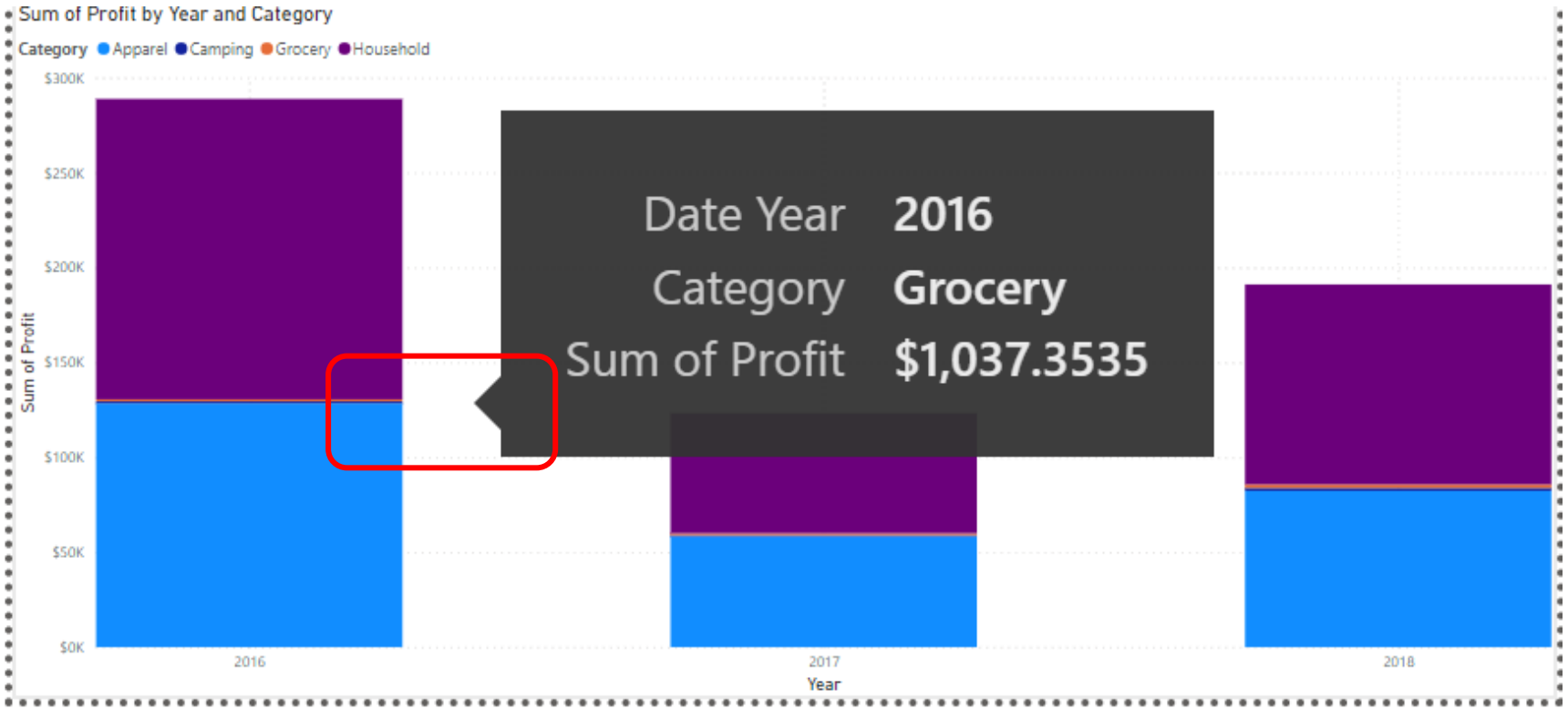
3. Tutorial week 5 – Chart and Display the Values

- **Navigate** your mouse on the Chart to display the values (date, category, sum of profit)



3. Tutorial week 5 – Chart and Display the Values

- **Navigate** your mouse on the Grocery category to display the values (date, category, sum of profit)



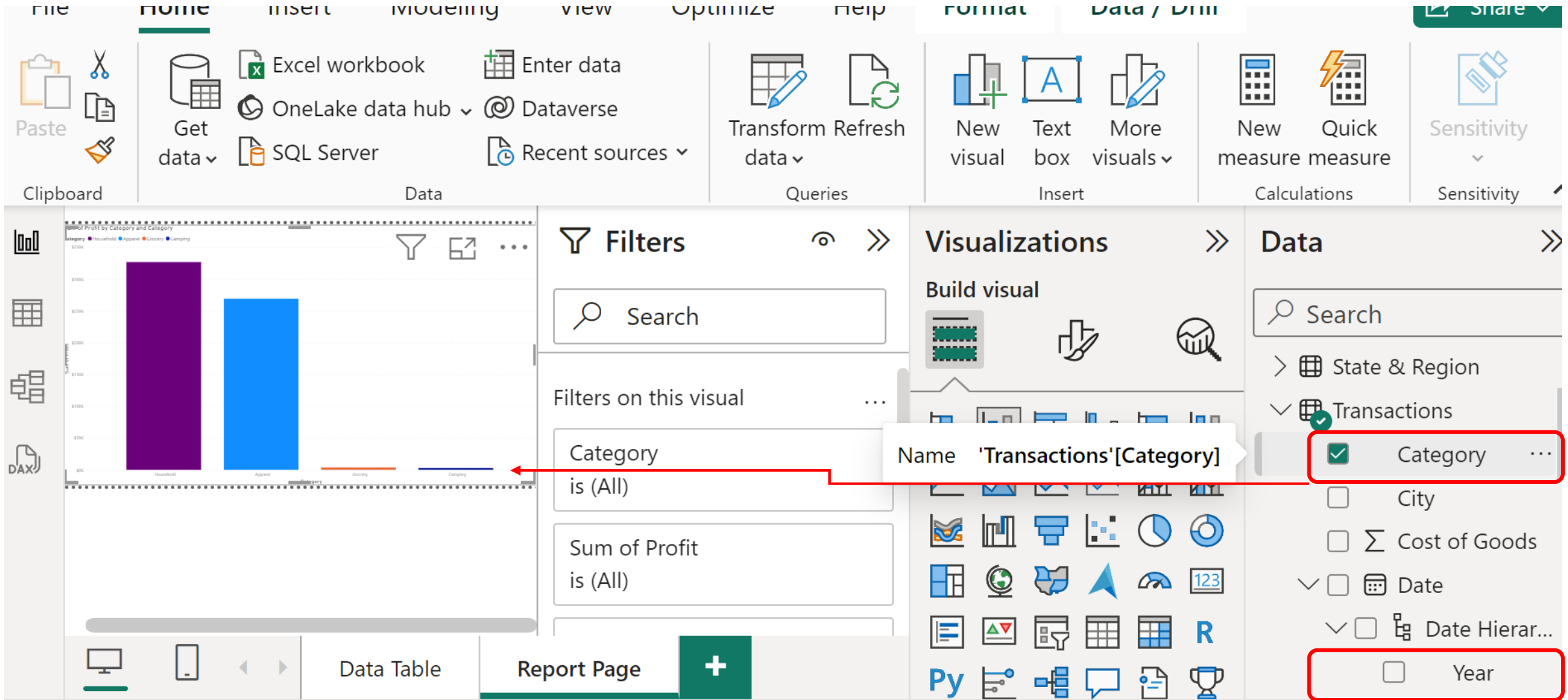
3. Tutorial week 5 – Task – Send the screenshot of the result to FKeivanian@my.holmes.edu.au

Test Your Skills

- What is the profit for the *Camping* category?

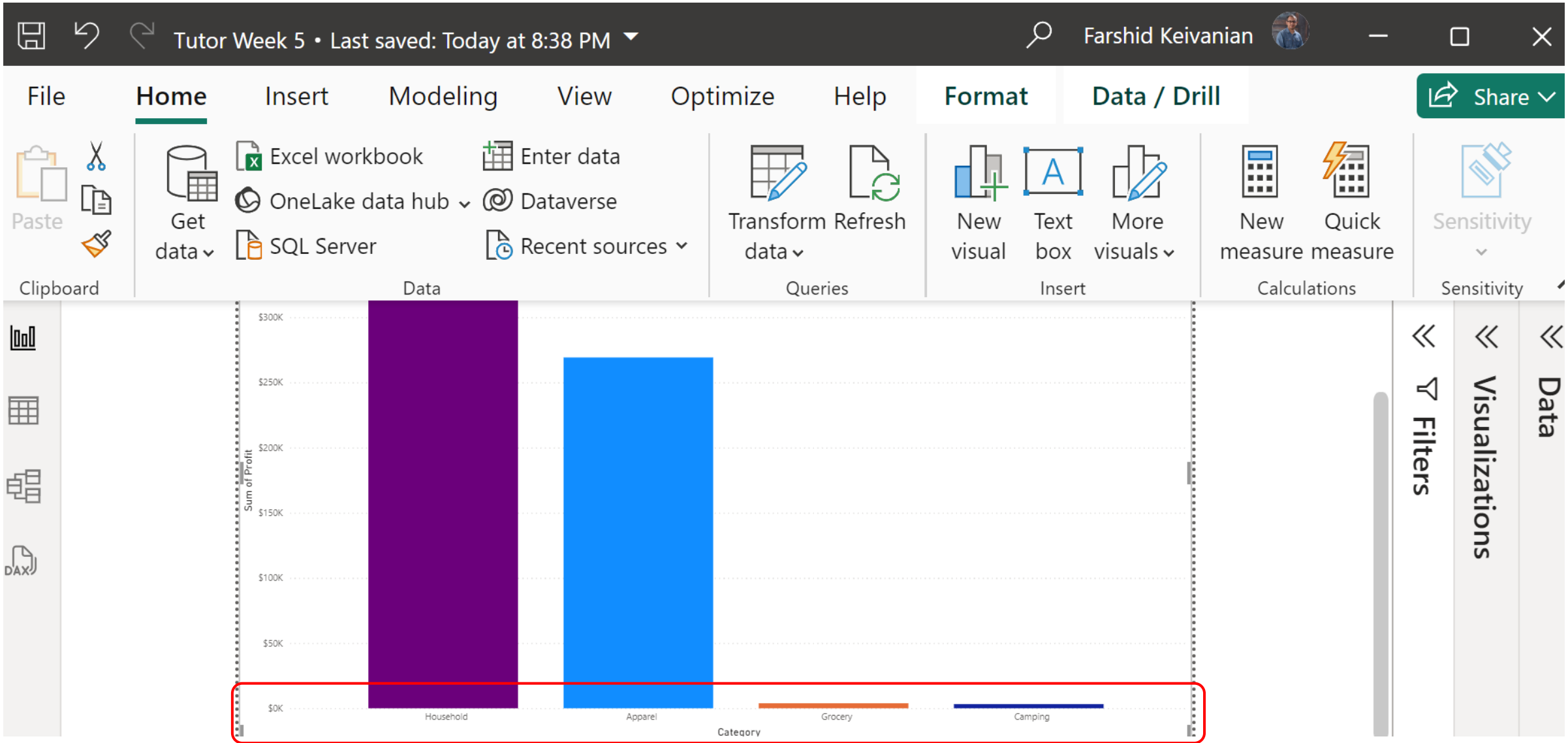
3. Tutorial week 5 – Clustered Column Chart

- Unselect **Year**
- **Drag** Category (hold your left mouse key on it and drag it) to the x-axis of the chart



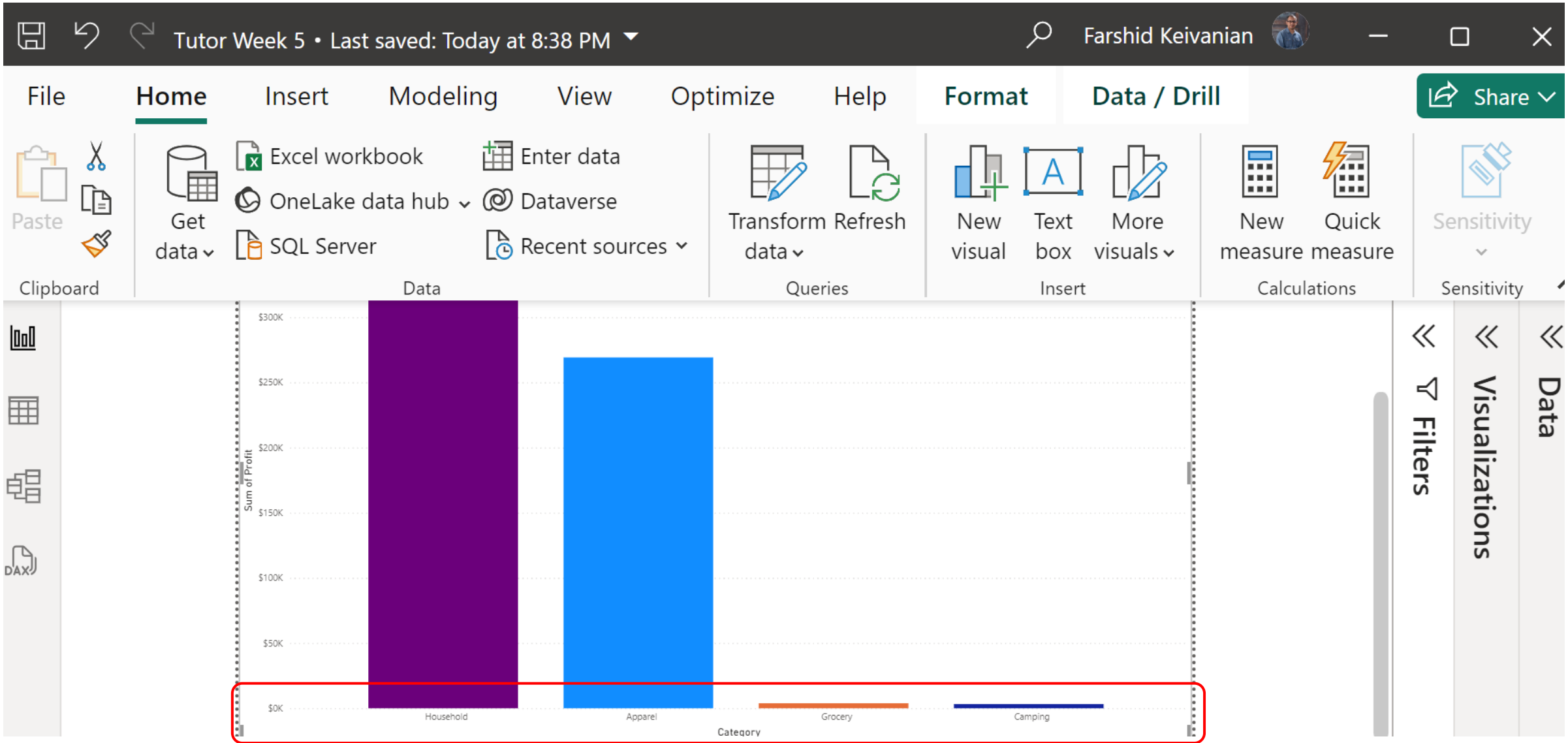
3. Tutorial week 5 – Clustered Column Chart

- Collapse Visualisation and Data Pane
- Resize the Chart



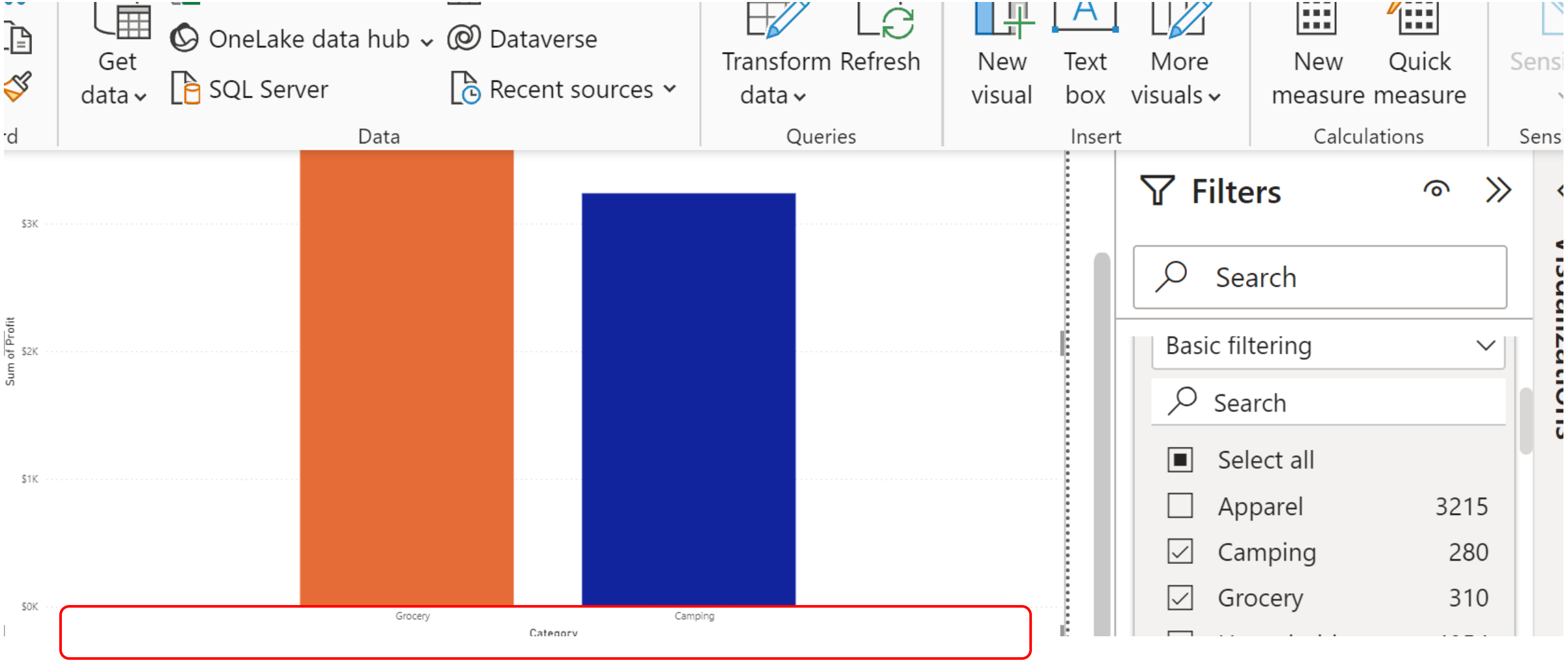
3. Tutorial week 5 – Clustered Column Chart

- It is still difficult to see any trends associated with the *Camping* and *Grocery* Category. We could filter the Category to only the *Camping* and *Grocery* category. To do this



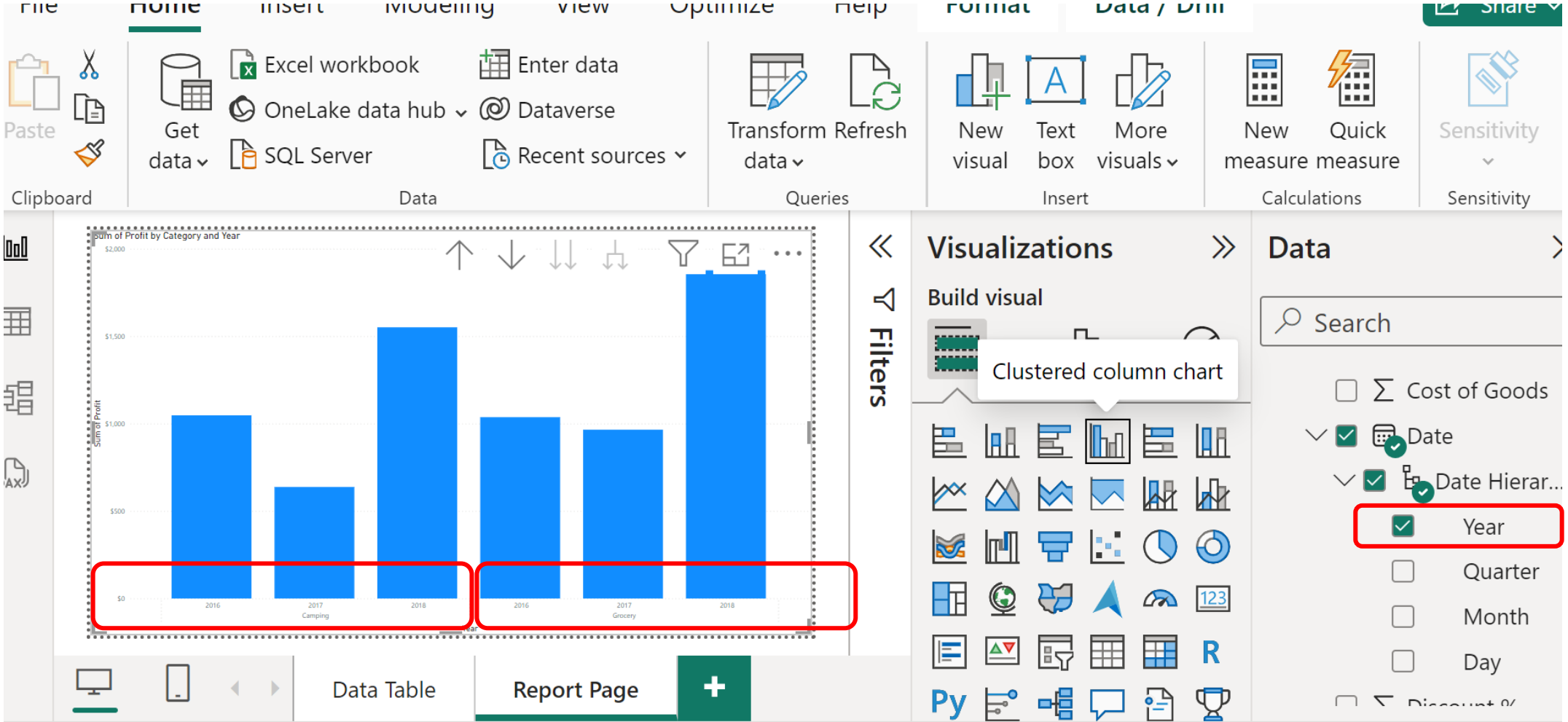
3. Tutorial week 5 – Clustered Column Chart

- **Expand** the Filters
- **Select** Only Camping and Grocery



3. Tutorial week 5 – Clustered Column Chart

- **Please make sure** the Year is Selected!
- **Select** Clustered Column Chart
- We have now added a chart visualisation to our report which displays the Profit by category by Year. It would be good to also display Profit by Category by Month



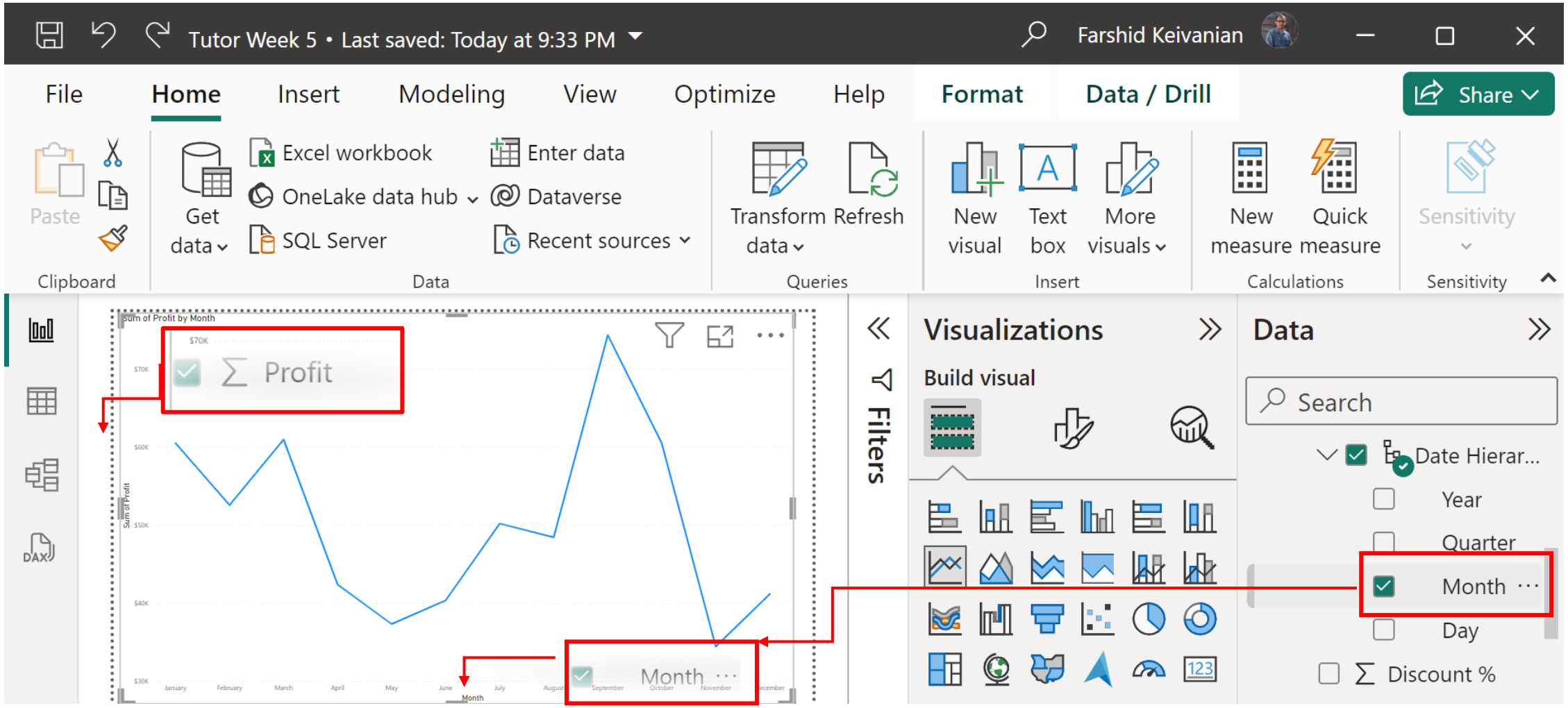
3. Tutorial week 5 – Task – Send the screenshot of the result to FKeivanian@my.holmes.edu.au

Test Your Skills

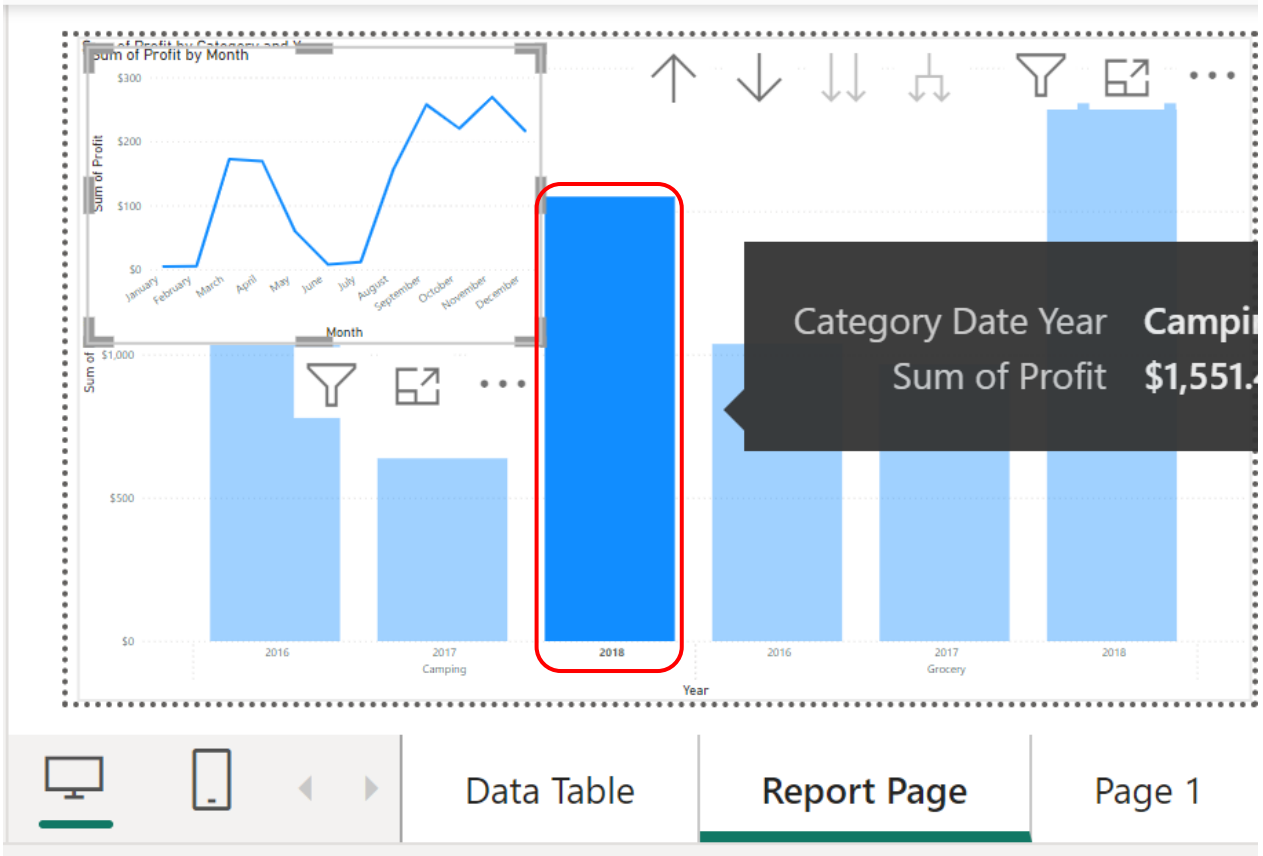
- Create Line Chart visualisation
- Insert Month on the Axis
- Insert Profit in Values

Your chart should Appear similar to below:

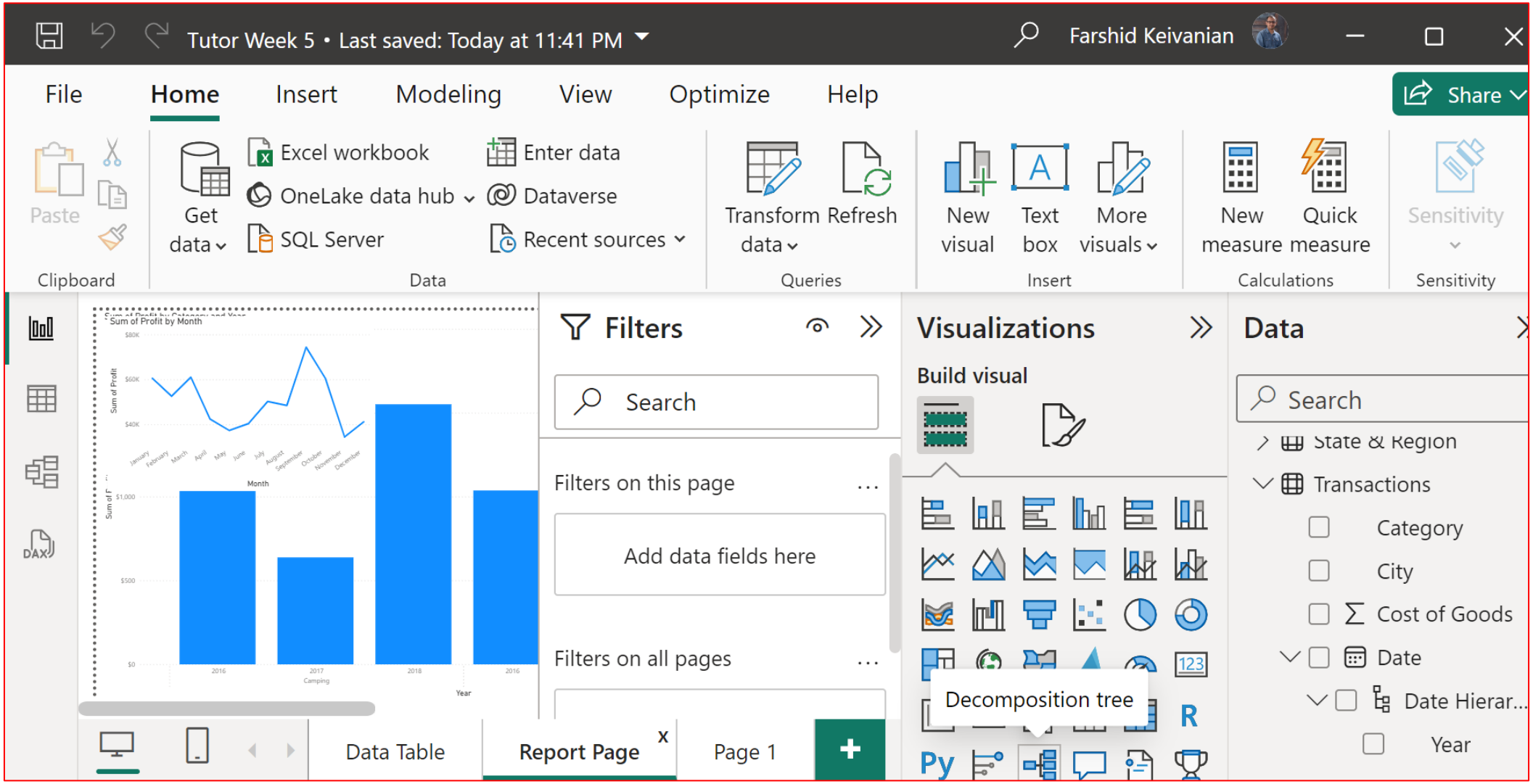
- **Select** Line Chart
- **Drag** Month to the X-Axis
- **Drag** Profit to the Y-Axis



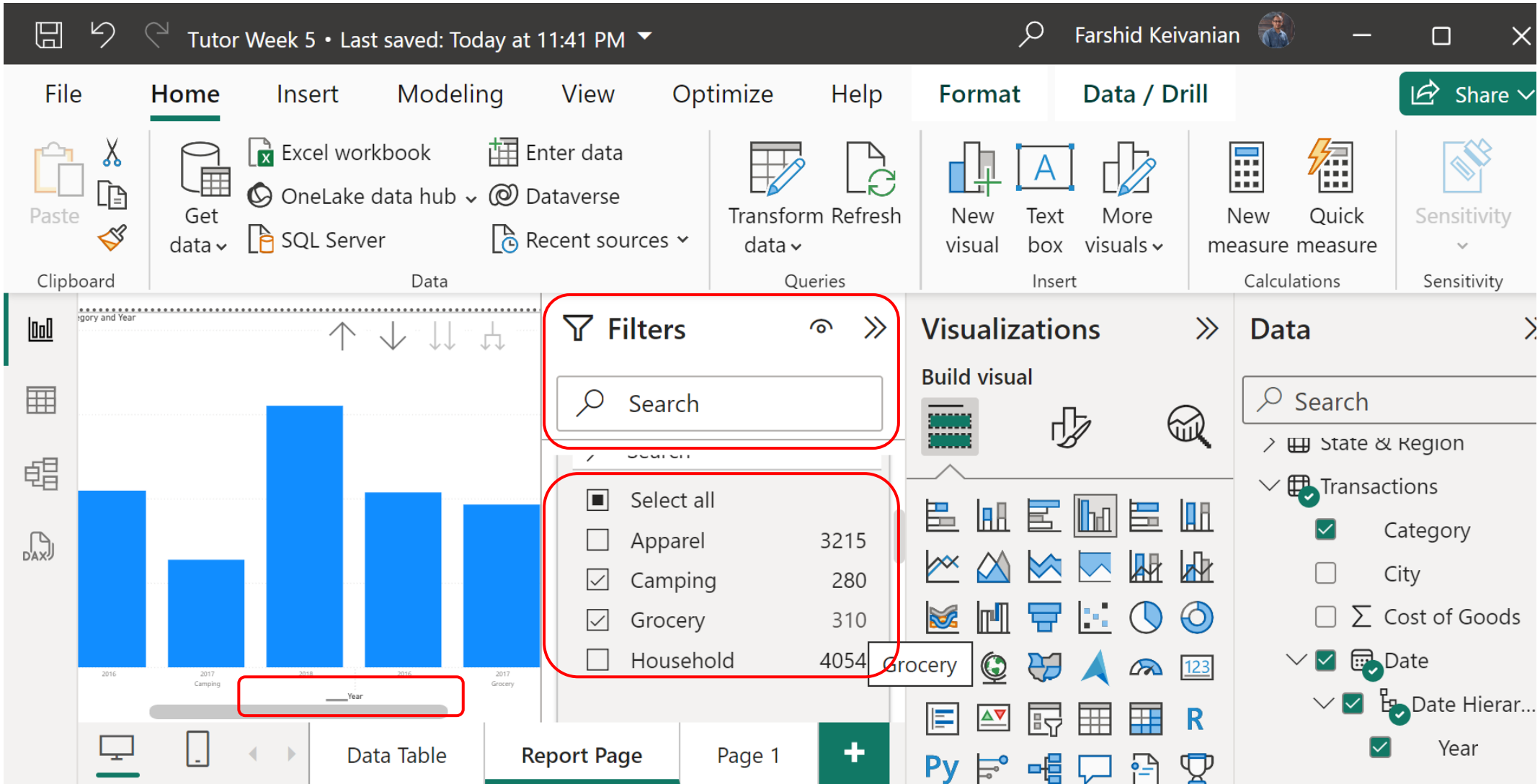
- **Cross-filtering** is a feature in Power BI that allows us to interact with one visual on a report page, and have that interaction affect the data presented in other visuals on the same page. It enables a user to focus on specific segments of data across different perspectives and is particularly useful for drilling down into details.
- **Click on Column Camping Profit in 2018,** the Profit by Month line chart will change accordingly as a cross-filter is applied:



- **Deselect** the Column Camping Profit in 2018 by clicking on it
- There is less need to have the Filter applied to the categories due to the new visualisation and the linking by cross-filters



- **Click** on the Column chart
- **Make** sure When you click on x-axis, the **Apparel** and **Household** categories in the **Filter Pane** are not selected



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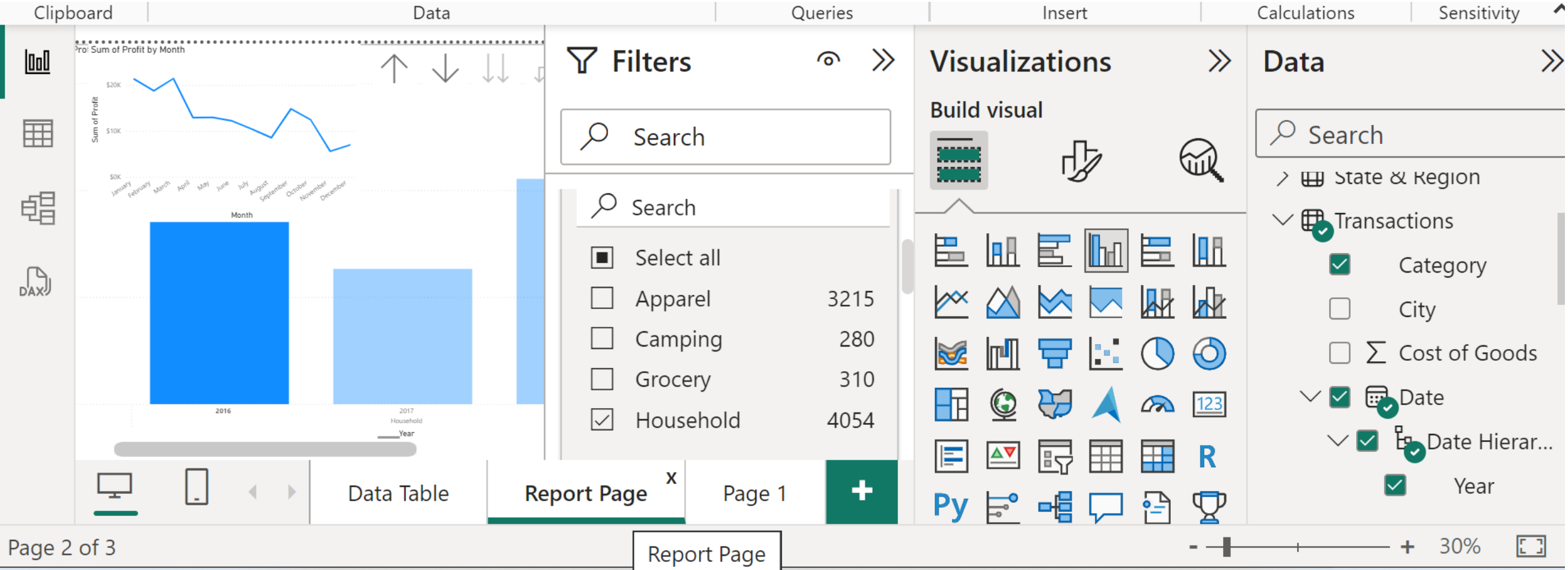
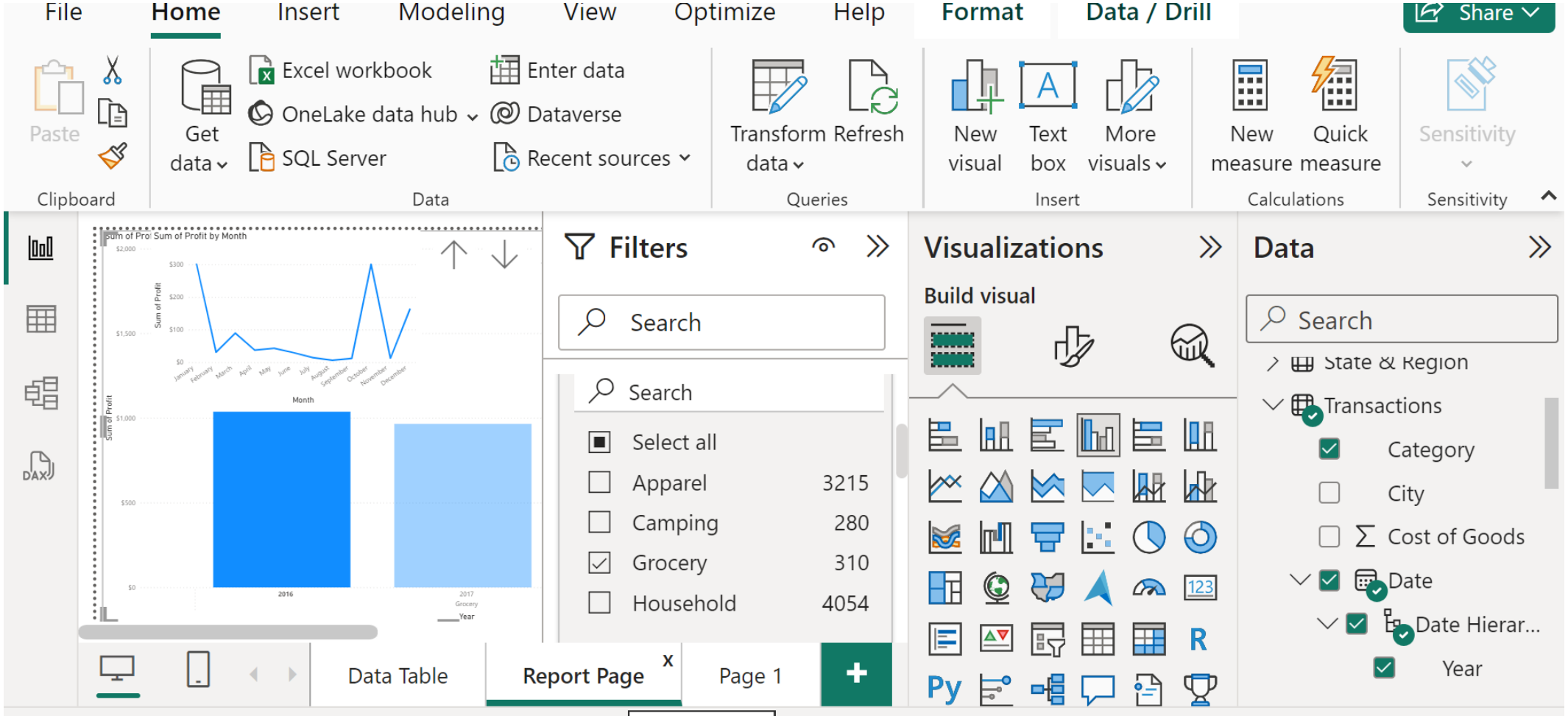
Test Your Skills

- Which month in 2016 had the lowest profit in the household category?
- Did the same month have the lowest profit in the Apparel category in 2016?
- Which month and year had the highest profit in the grocery category?

- **Select Category Household**
- **Click on 2016**
- **Move your mouse towards down** to see the line chart
- November seems to be the lowest profit in the household category, right?

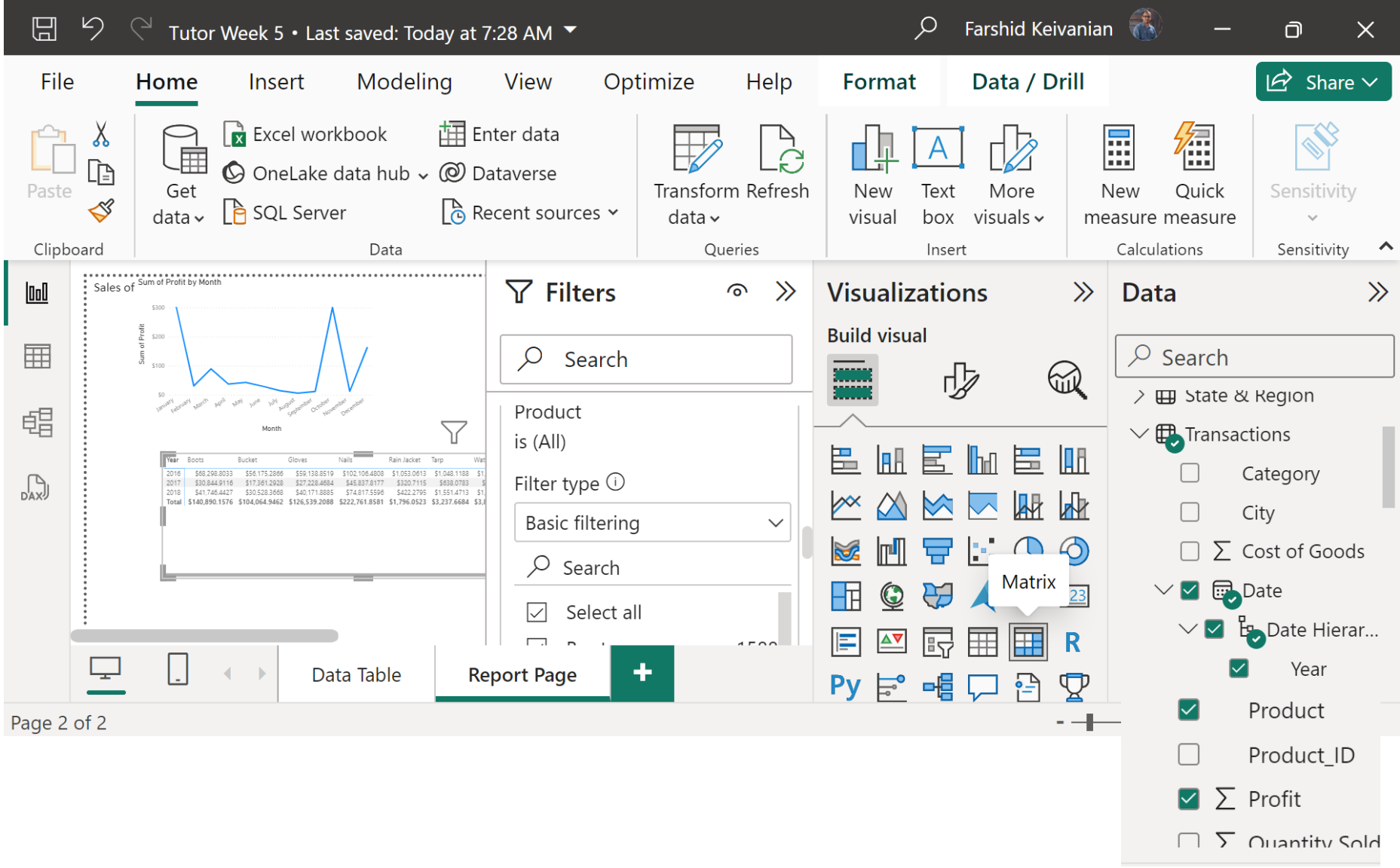


- **Select Category Grocery**
- **Click on 2016**
- **Move your mouse towards down** to see the line chart
- October seems to be the highest profit in the household category, right?



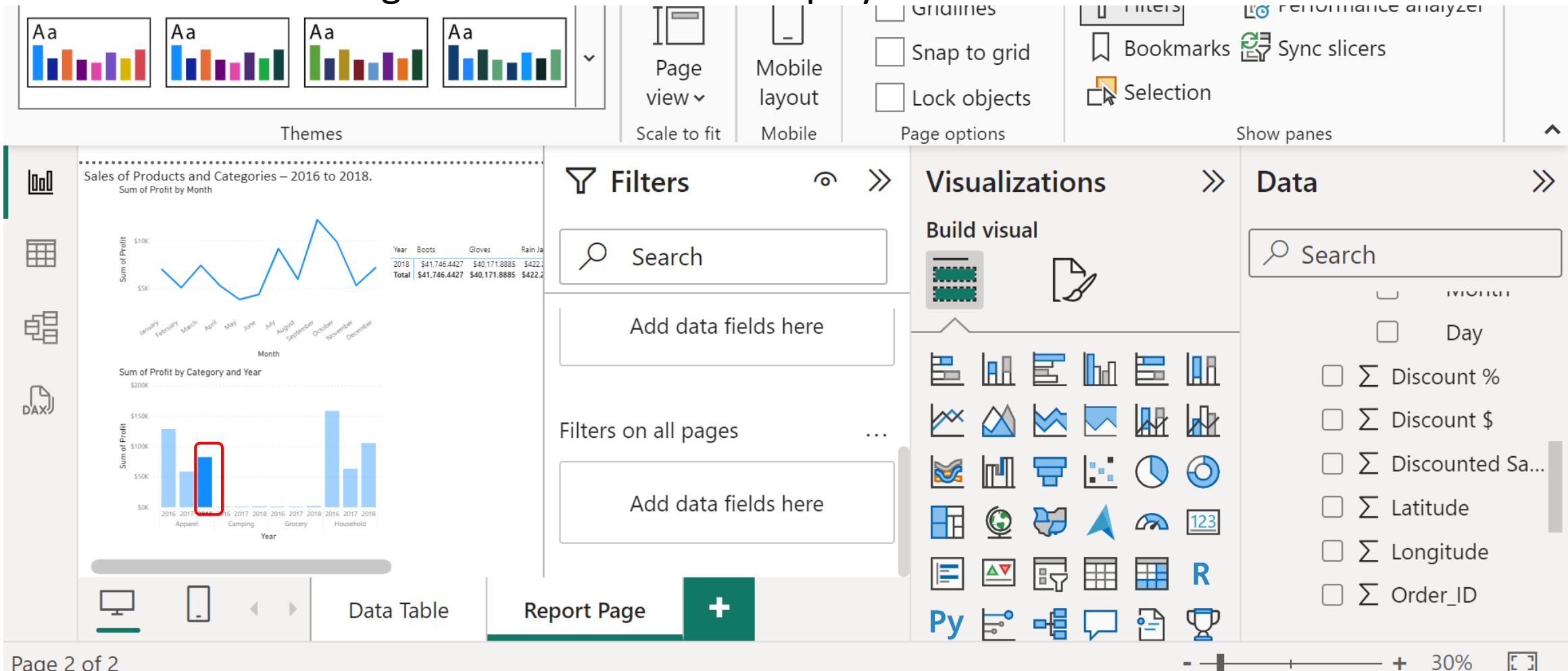
To understand the profit for products by year:

- **Add a Matrix** by clicking on it
- **Deselect ‘Category’**
- **Select ‘Year’ and ‘Product’** from Data plane (right side)



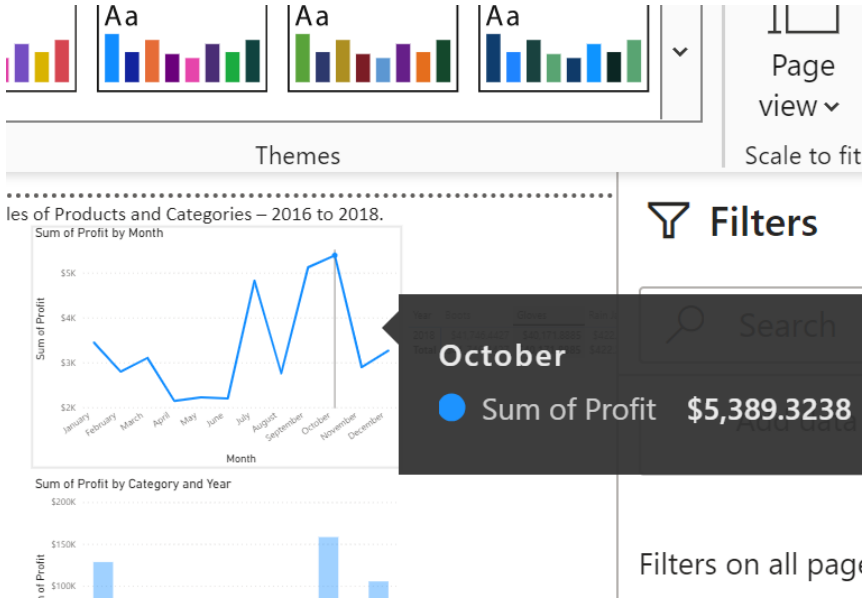
There are now three visualization in the report which are linked with cross-filters.

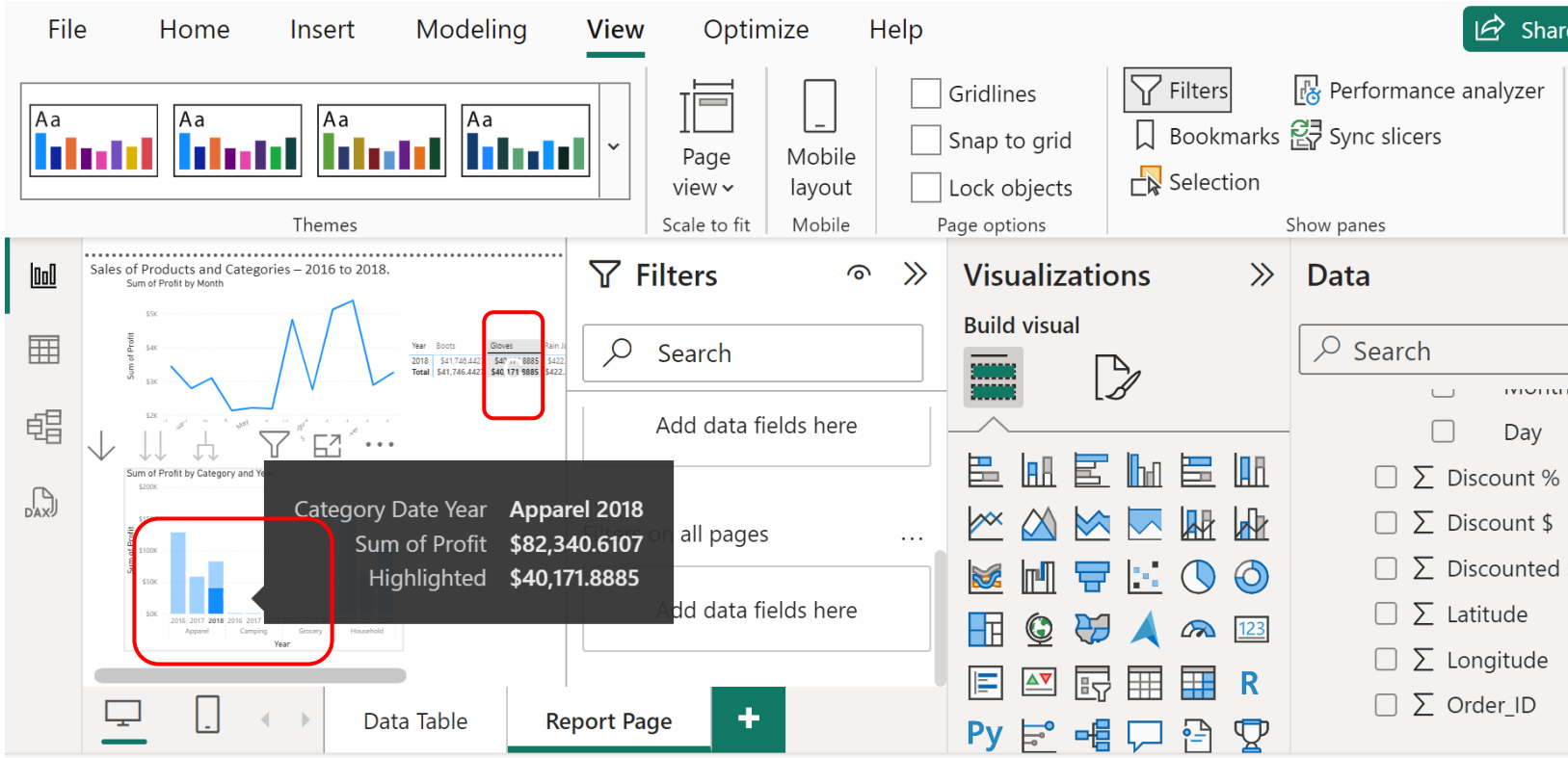
- **Click on** any of the columns in the Household category in the column chart, the line chart and matrix update accordingly.
- **Click on** the same column again to de-select and display all values.

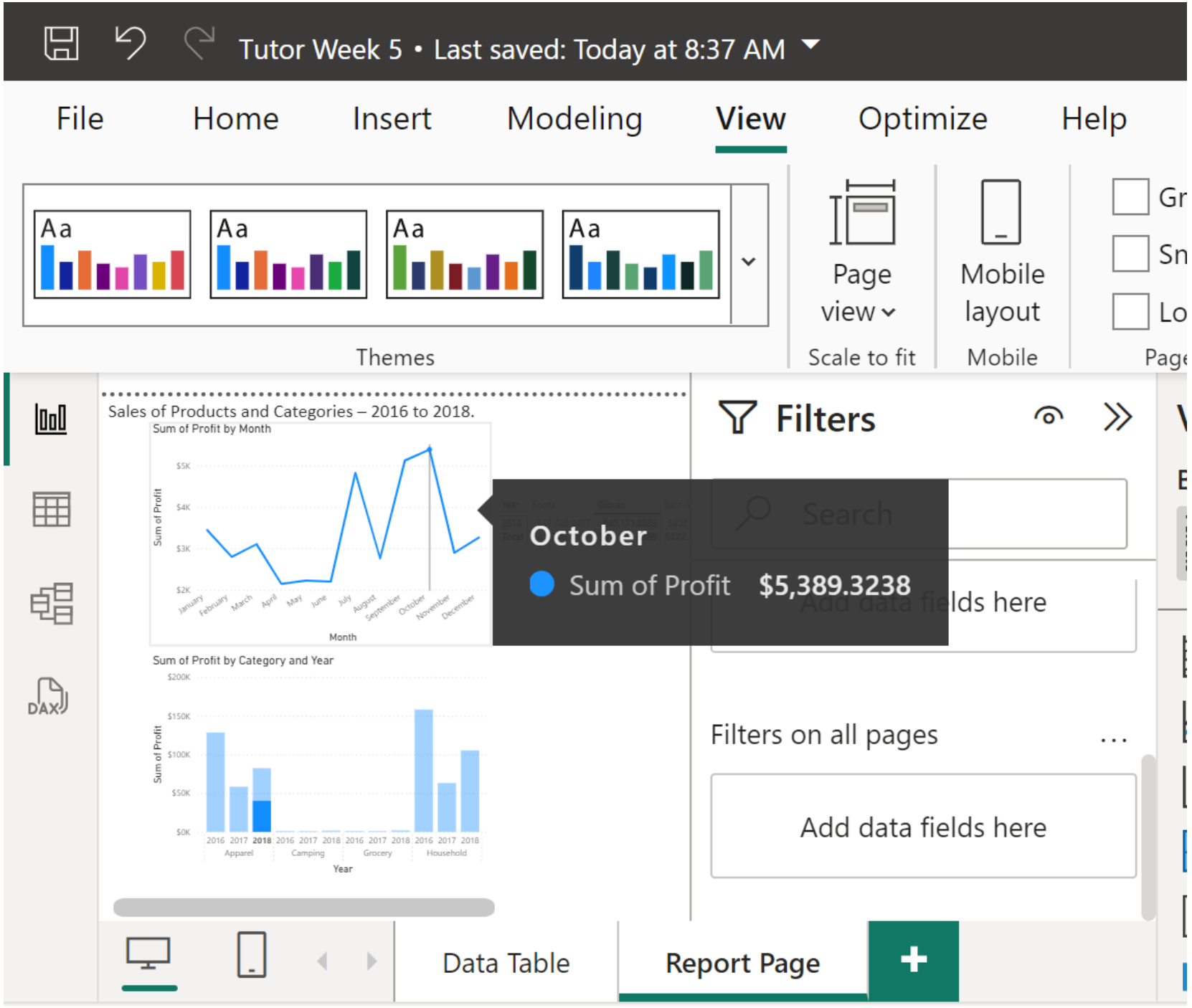


Two cross-filters to determine which month in 2018 had the highest profit for gloves:

- **Click on Gloves** in the Matrix
- **Press <ctrl> (Control) and click 2018 column in the Apparel category.**
- It shows October is the most profitable month for Gloves in 2018






Tutor Week 5 • Last saved: Today at 8:37 AM
File
Home
Insert
Modeling
View
Optimize
Help
Aa
Aa
Aa
Aa
Themes
Page view
Scale to fit
Mobile layout
Mobile
Sales of Products and Categories – 2016 to 2018.
Sum of Profit by Month
Sum of Profit
Month
October
Sum of Profit $5,389.3238
Sum of Profit by Category and Year
Year
Apparel
Camping
Grocery
Household
Filters
Search
Filters on all pages
Add data fields here
Data Table
Report Page

3. Tutorial week 5 – Task – Send the screenshot of the result to FKeivanian@my.holmes.edu.au

Test Your Skills

- What was the profit for gloves in November 2018?
- Which month in 2016 had the least profit for nails?

4. Attendance & Tutorial Questions - Recognising student participation and engagement specifically identifying those who are most actively involved!

Thank you,
Happy a Learning Day
Dr. Farshid Keivanian