



# Hands-on Lab : Creating and Configuring Visualizations in Reports with Looker Studio

**Estimated time needed:** 60 minutes

In this lab, you will learn how to include more pages in a report, and how to join multiple data rows from multiple tables to create a blended data source. Then you will learn how to add controls and filters to your visualizations to enhance a report's interactivity, and how to add different types of chart visualizations to your reports.

## Software Used in this Lab

Like the videos in the course, for the hands-on labs we will be using Google's **Looker Studio** as this is available at no charge.

## Dataset Used in this Lab

The dataset used in this lab comes from the VM designed to showcase IBM Cognos Analytics. This dataset is published by IBM. You can download the dataset file directly from here: [CustomerLoyaltyProgram.csv](#)

## Objectives

After completing this lab, you will be able to:

- Configure page settings and add new pages
- Blend data from multiple tables and create a bar chart
- Add a drop-down list control and filters to a visualization
- Add a bubble map, a heatmap, and a treemap

## Exercise 1: Configure page settings and add new pages

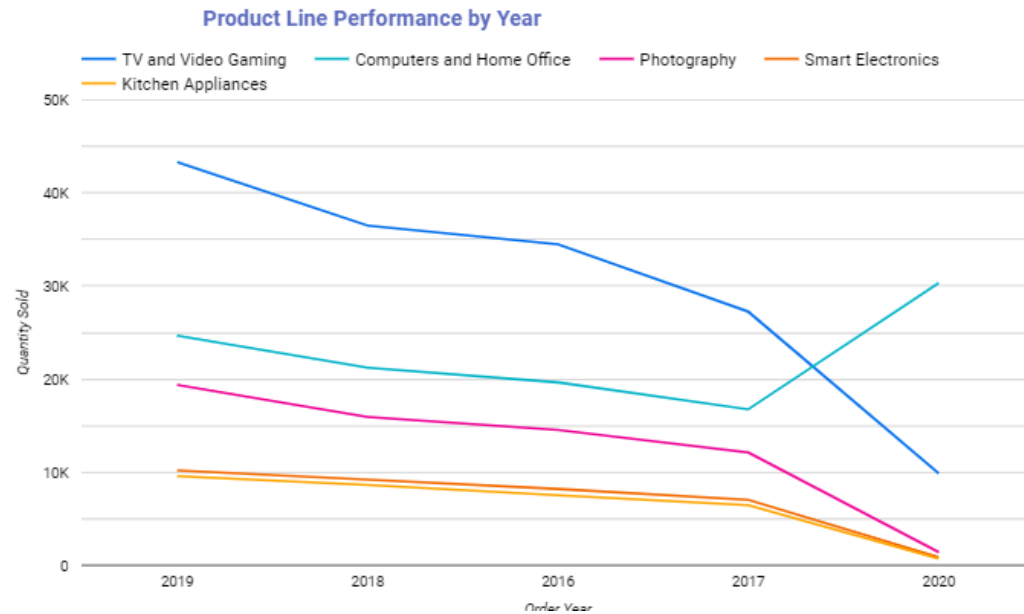
### Task 1: Configure page settings

In this exercise, you will learn how to change the page settings and add new pages to your report.

1. Right click on the canvas and click **Current Page Settings**.

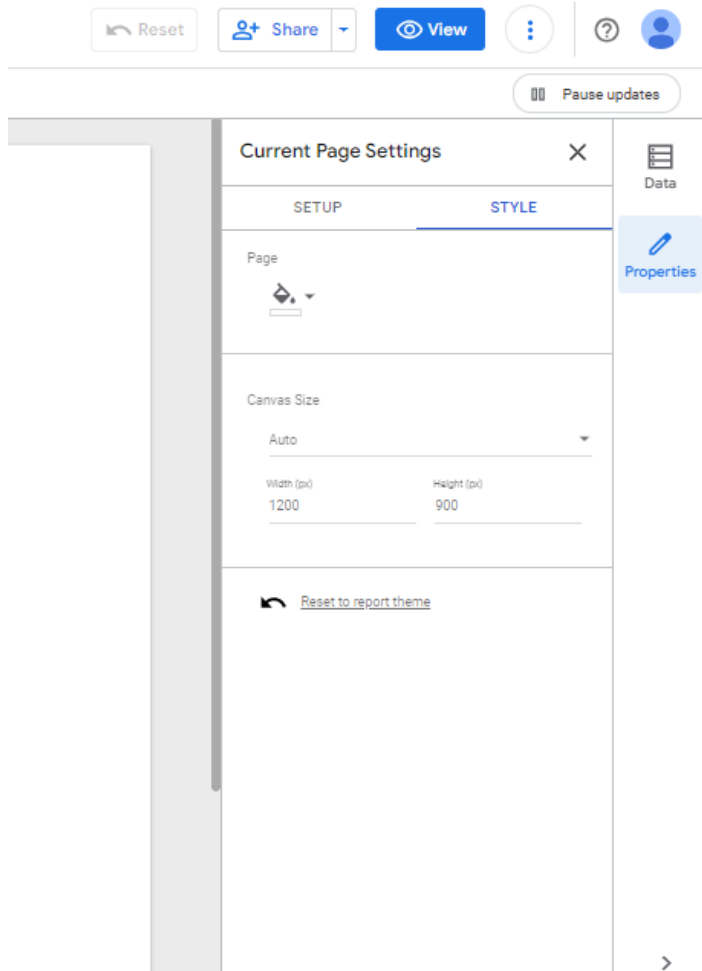
Quantity Sold  
**396,100**

Revenue  
**228.7M**

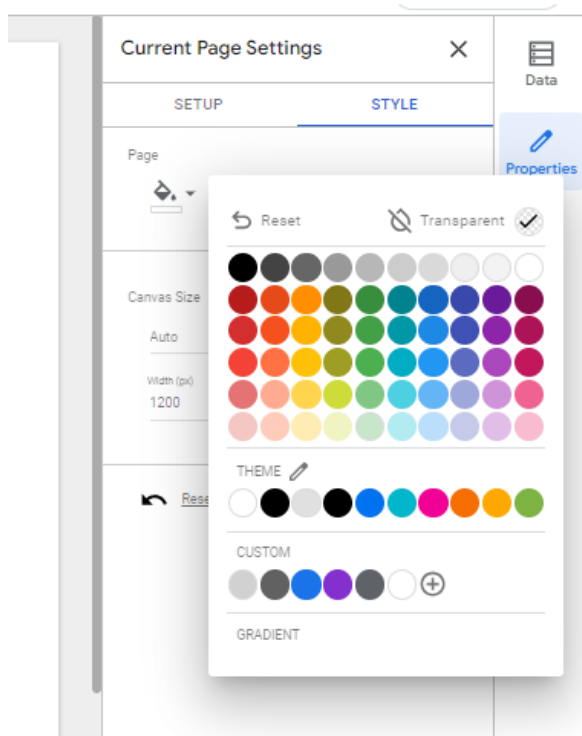


- Select
- Theme and layout
- Report settings
- Current page settings
- Paste
- Download page as PDF

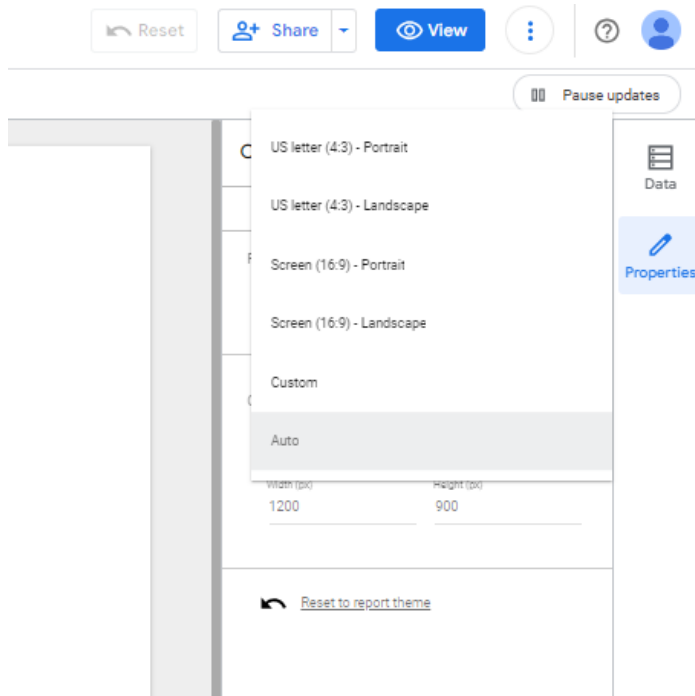
You will see that the properties for the page are displayed in the **Current Page Settings** tab in the right panel.



2. Click the **STYLE** tab, select the **Page background** drop-down arrow and select a **pale blue** background color. From here, you can also choose a specific Theme color, or choose a custom gradient color.

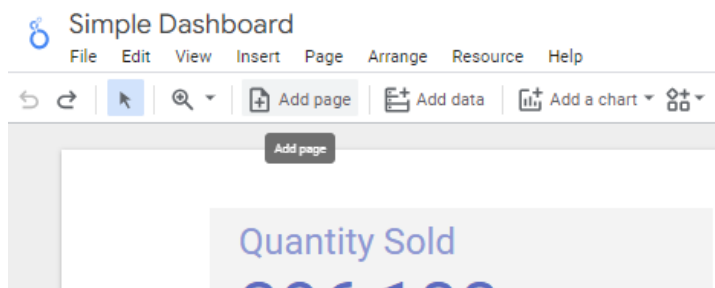


3. Under **Canvas Size**, click the drop-down arrow and select **Screen (16:9) - Landscape**. Note the width and height dimensions change.
4. Click the drop-down arrow again and select **Auto** to change it back to the original default size.



## Task 2: Add new pages

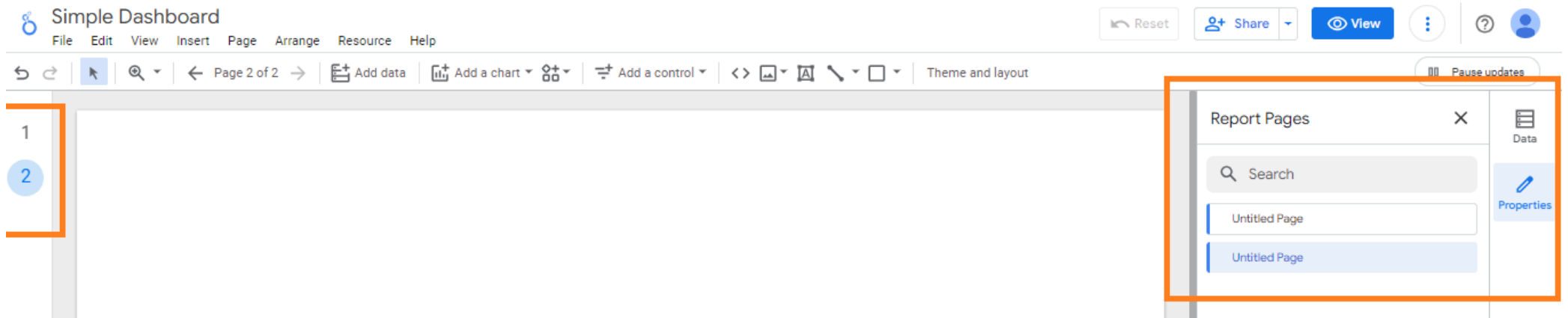
1. In the toolbar, click **Add page** to add a new page to your report.



A new page will be displayed and on the left side panel.

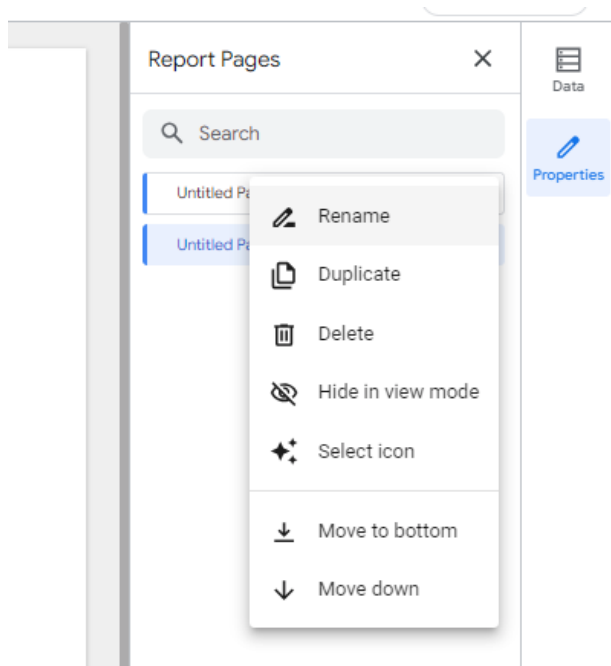
2. You can switch between the pages by clicking on the page numbers in the left pane. Click page **1**, then click page **2**.
3. Click the toolbar button that says **Page 2 of 2**. This is the **Manage pages** option.

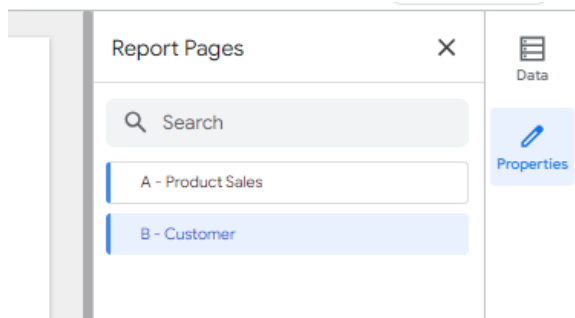
Notice that the **Report Pages** properties panel opens and shows both pages, and in this case note that neither of these pages is titled.



Let's update the page titles for both of the pages as *A - Product Sales* and *B - Customer* respectively.

4. To do this, click on the ellipsis button next to each one (the vertical three dots) and click **Rename**.





You can also toggle between pages from here as well.

## Exercise 2: Blend data from multiple tables and create a bar chart

In most cases the data you want to visualize is not available in one table. Instead it is available in multiple tables. In such cases you will need to relate these tables and fetch relevant data for creating your reports and dashboards.

In this case let's consider you have two tables - one with customer details such as *name*, *full name*, *gender*, *loyalty number* and *customer\_ID* and another table with details on the customer loyalty program, such as *cust\_ID*, *Income*, *Order Year*, *Quarter*, *MonthsAsMember*, *LoyaltyStatus*, *Product Line*, *Quantity Sold*, *Unit Sale Price*, *Unit Cost*, *Revenue*, and *Customer Lifetime Value*.

Now if you want to find out **Total quantity sold for Males and Females**, you will need to use both the tables. You can easily perform this task using the blending data functionality.

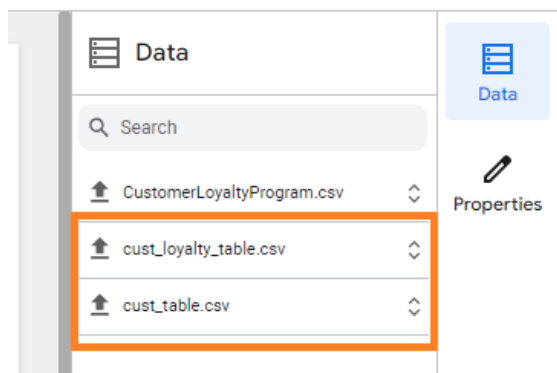
Blending data in Looker Studio involves creating relationships between different datasets and then using those relationships to create combined queries and reports.

**NOTE:** Two subdatasets have been created from the CustomerLoyaltyProgram.csv to perform this exercise. You can download them from here:

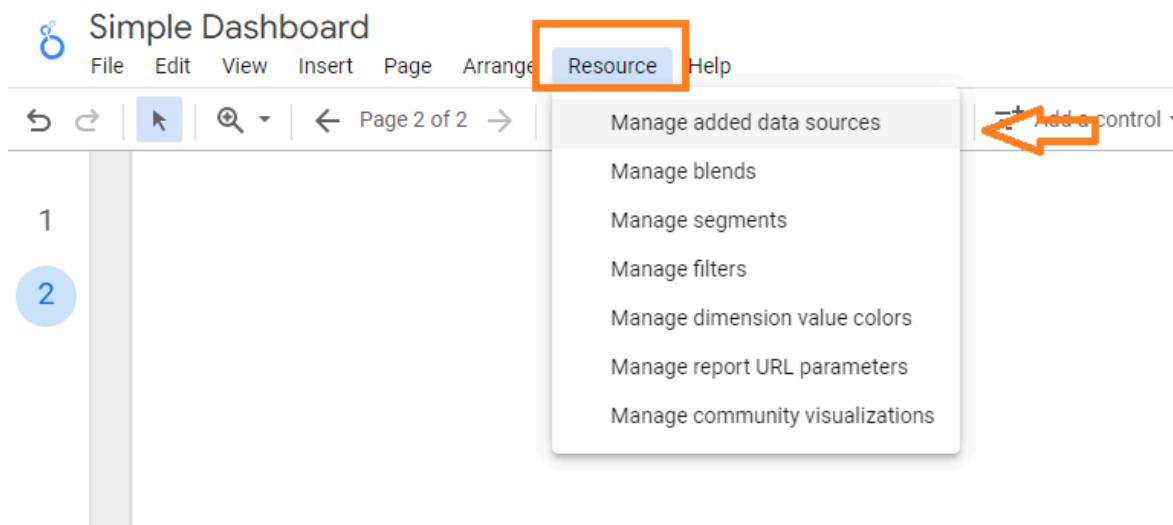
[cust\\_loyalty\\_table.csv](#)

[cust\\_table.csv](#)

1. In the toolbar, click **Add data**.
2. On the **Connect to data** page, select the **File Upload** connector, click **CLICK TO UPLOAD FILES**.
3. Browse to the folder where the files are located, select [cust\\_loyalty\\_table.csv](#) and click **Open**.
4. Once the *Status* updates to **Uploaded** for the first file, click **Add**, and then click **ADD TO REPORT**.
5. Repeat steps 1 to 4 to upload and add the [cust\\_table.csv](#) file also.



6. In the toolbar, click **Resource**, and then click **Manage added data sources**.



Here you can edit the data source and verify or modify the type of data attributes in the data if required.

7. Click **EDIT** for the **cust\_table.csv** data source.



Simple Dashboard

File Edit View Insert Page Arrange Resource Help

Reset

Share

View

Data sources

CLOSE

Name	Connector Type	Type	Used in report	Status	Actions	Alias
CustomerLoyaltyProgram.csv	File Upload	Reusable	3 charts	Working	EDIT            DUPLICATE            REMOVE	ds0
cust_loyalty_table.csv	File Upload	Embedded	0 charts	Working	EDIT            DUPLICATE            REMOVE            MAKE REUSAB	ds8
cust_table.csv	File Upload	Embedded	1 chart	Working	EDIT            DUPLICATE            REMOVE            MAKE REUSAB	ds6

ADD A DATA SOURCE

Simple Dashboard

File Edit View Insert Page Arrange Resource Help

Reset

Share

View

← cust\_loy\_table.csv

Scope: Embedded

Data credentials: P P

Data freshness: 12 hours

Community visualizations access: On

DONE

← EDIT CONNECTION | FILTER BY EMAIL

ADD A FIELD
 ADD A PARAMETER

Field ↓	Type ↓	Default Aggregation ↓	Description ↓
DIMENSIONS (7)			
Cust_ID	123 Number	Sum	
Customer Name	ABC Text	None	
Education	ABC Text	None	
First Name	ABC Text	None	
Gender	ABC Text	None	
Last Name	ABC Text	None	
Loyalty#	123 Number	Sum	

8. You don't need to make any modifications in this case, so click **DONE** to close the window, then close the **Data sources** window.

Let's now add a bar chart to display the quantity sold by gender.

9. In the left pane, ensure that page 2 is selected.

10. Click **Add a chart**, in the **Bar** section, select the **Column chart** and position it on the canvas at the top left and left-click to place it there.

Looker Studio has picked the data table automatically, which you can ignore for now.

11. In the **Chart** properties pane, click **BLEND DATA**, and close the pop-up window that opens.

Notice that Table 1 is picked automatically by Looker Studio, but you will change it.

The screenshot shows the Looker Studio interface with a column chart titled 'Record Count' on the canvas. The chart has a y-axis with values 50 and 60. The chart is positioned on the left side of the canvas. The right sidebar shows the 'Chart' properties pane with the 'SETUP' tab selected. The 'Data source' section shows 'cust\_table.csv' and a '+ BLEND DATA' button. An orange arrow points to the '+ BLEND DATA' button. Below the chart, the 'Blend Data' dialog is open. The dialog has a 'Table 1 (Table Name)' drop-down menu with 'cust\_table.csv' selected. The 'Dimensions' section has 'First Name' selected. The 'Metrics' section has 'Record Count' selected. The 'Available Fields' list includes 'Cust\_ID', 'Customer Name', 'Education', 'First Name', 'Gender', and 'Last Name'. A 'Join another table' button is visible. The 'Blended Data (1)' section shows 'First Name' and 'Record Count' as included dimensions and metrics. The 'Hide repeated join fields' checkbox is checked. A 'SAVE' button is at the bottom.

1

2

Blend Data ?

Table 1 (Table Name)

2

3

4

5

Join another table

Available Fields

Type to search

123 Cust\_ID

ABC Customer Name

ABC Education

ABC First Name

ABC Gender

ABC Last Name

Dimensions

ABC First Name

Add dimension

Metrics

AUT Record Count

Add metric

Data source name

Blended Data (1)

Included dimensions and metrics ?

ABC First Name

123 Record Count

Hide repeated join fields

SAVE

12. In the *Table 1 (Table Name)* drop-down menu, select **cust\_loyalty\_table.csv**, drag **Cust\_ID** to the **Dimension** field, drag **Quantity Sold** to the **Metric** field to replace *Record Count*, and then click **Join another table**.

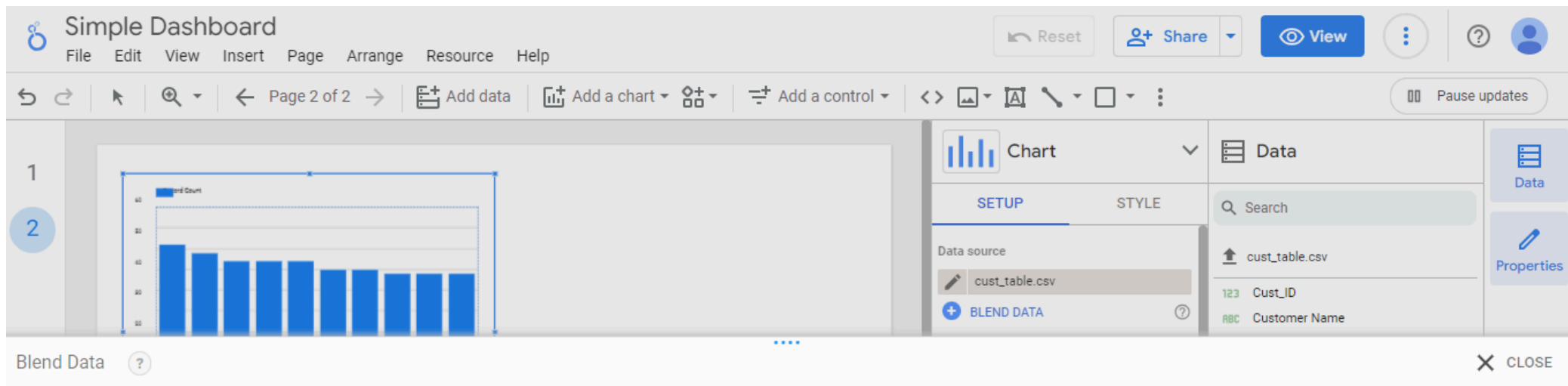


Table 1 (Table Name)

↑ cust\_loyalty\_table.csv

Dimensions

123 Cust\_ID

Available Fields

Type to search

123 Order Year

ABC Product Line

123 Quantity Sold

ABC Quarter

123 Revenue

123 Unit Cost

Configure join

Table 2 (Table Name)

↑ cust\_table.csv

Dimensions

123 Cust\_ID

ABC Gender

Available Fields

Type to search

ABC Education

ABC First Name

ABC Gender

ABC Last Name

123 Loyalty#

123 Record Count

Join another table

Data source name

Blended Data (1)

Included dimensions and metrics

ABC Gender

123 Cust\_ID (Table 1)

123 Quantity Sold

123 Cust\_ID (Table 2)

☒ Hide repeated join fields

One or more join configurations is incomplete

SAVE

13. For the second table select **cust\_table.csv** as the table name for Table 2, and **Cust\_ID** should already be in the first **Dimension** field.

14. Drag **Gender** to the **Add dimension** field under **Dimension**. So, you should now have both **Cust\_ID** and **Gender** listed under **Dimension**.


15. Click **Configure join**.

16. In the **Join configuration** window that opens, select the **Left outer** join, accept **Cust\_ID** as the default join condition, and then click **Save**.


### Join configuration

#### Join operator


Tell us how rows from all the tables on the left and the table to the right are combined.




Left outer




Right outer



Inner



Full outer



Cross

Returns matching rows from the right table, plus non-matching rows from the left tables

#### Join conditions

Tell us how these tables are related. Add one or more fields from the tables to the left that match the fields in the table to the right.

123 Cust\_ID (Table 1)

+ Add field

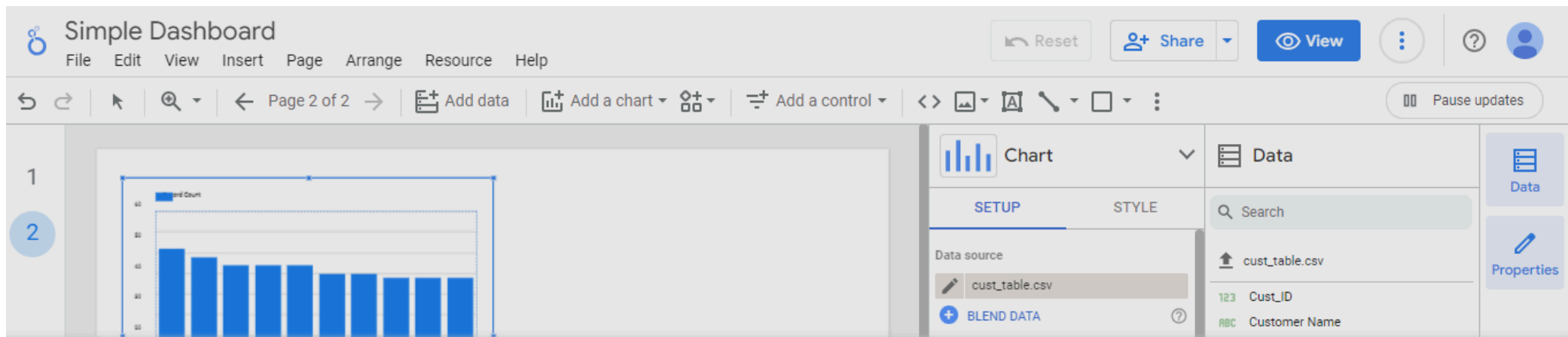
123 Cust\_ID (Table 2)

+ Add field

Cancel

Save

17. Once the join is configured, click **SAVE**.



Blend Data ? CLOSE

Table 1  
(Table Name)

↑ cust\_loyalty\_table.csv

Dimensions

- 123 Cust\_ID
- + Add dimension

Metrics

- SUM Quantity Sold
- + Add metric

Available Fields

- Type to search
- 123 Order Year
- ABC Product Line
- 123 Quantity Sold
- ABC Quarter
- 123 Revenue
- 123 Unit Cost

1 condition

Table 2  
(Table Name)

↑ cust\_table.csv

Dimensions

- 123 Cust\_ID
- ABC Gender
- + Add dimension

Metrics

- + Add metric

Available Fields

- Type to search
- ABC Education
- ABC First Name
- ABC Gender
- ABC Last Name
- 123 Loyalty#
- 123 Record Count

Join another table

+

Data source name

Blended Data (1)

Included dimensions and metrics ?

- ABC Gender
- 123 Cust\_ID
- 123 Quantity Sold

☒ Hide repeated join fields

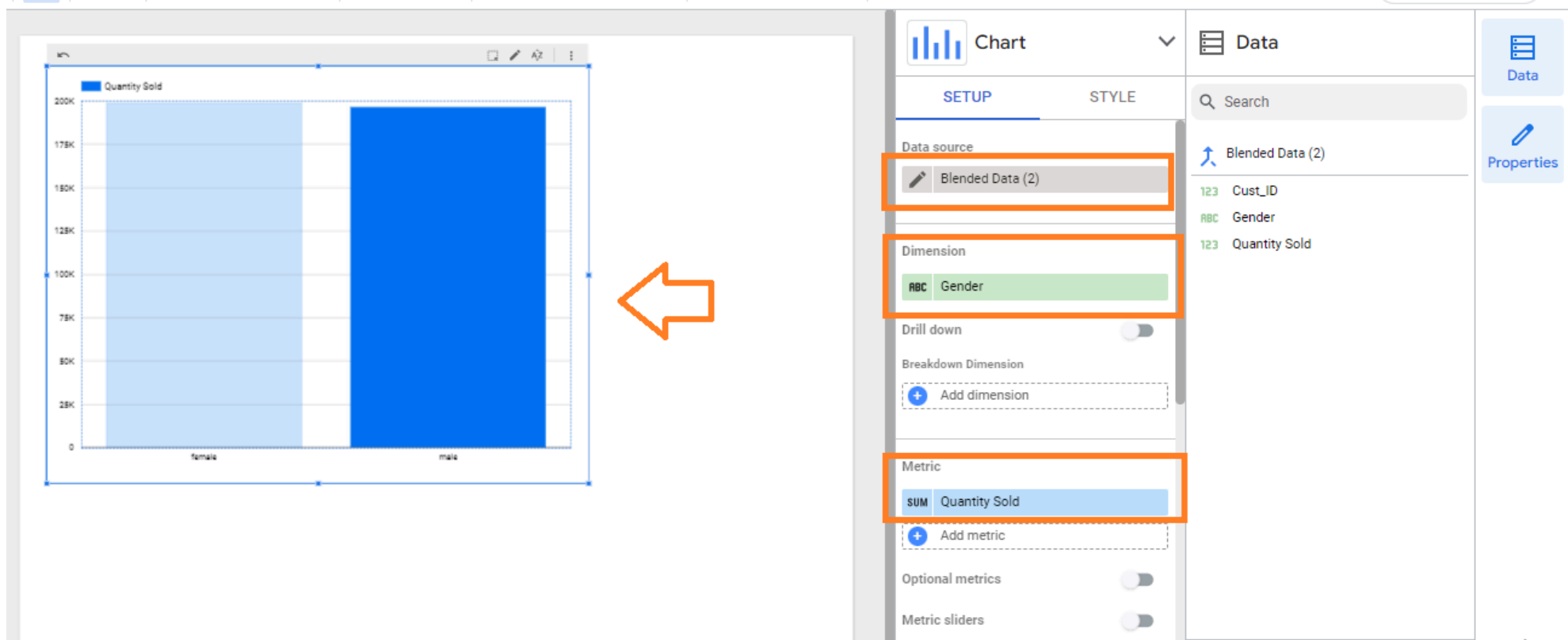
**SAVE**

18. Once the data has been blended, select the updated chart on page 2 to open the **Chart** properties pane.

19. From the **Data** pane on the right, drag **Gender** to **Dimension** in the **Chart** properties pane, to replace *Quantity Sold*.

20. Leave **Quantity Sold** in the **Metric** and **Sort** fields, and your bar chart will update.

Once your chart has finished updating, it should look similar to the image below.



By default, Looker Studio will pick *SUM* as the metric for **Quantity Sold**, but you can change it if required.

21. Under **Metric**, click **SUM** next to **Quantity Sold**, and select **Average** from the list. The chart will update accordingly.

AVG Quantity Sold

Name

Data Type

Number

Aggregation

☐ Sum

☒ Average

☐ Count

☐ Count Distinct

☐ Min

☐ Max

☐ Median

☐ Standard Deviation

☐ Variance

Comparison calculation

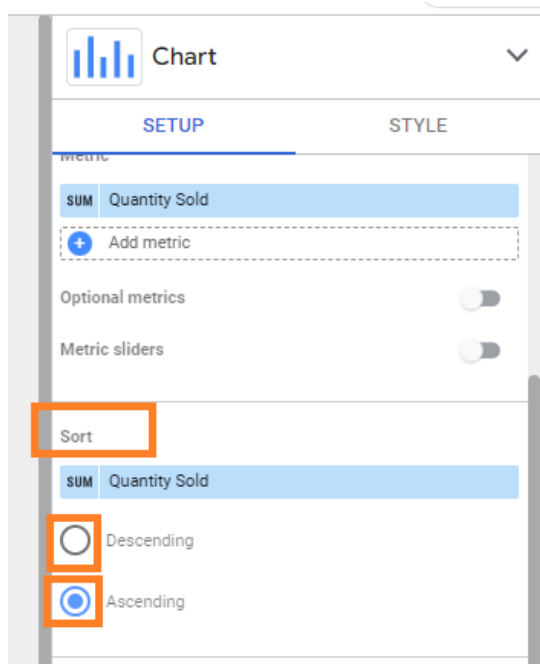
None

Running calculation

None

You can also display the metric sorted in ascending or descending order by selecting the relevant radio button under the **Sort** section of the **SETUP** tab in the **Chart** properties pane.

22. Under **Sort**, select **Ascending** and the chart will update accordingly to display *male* before *female*.



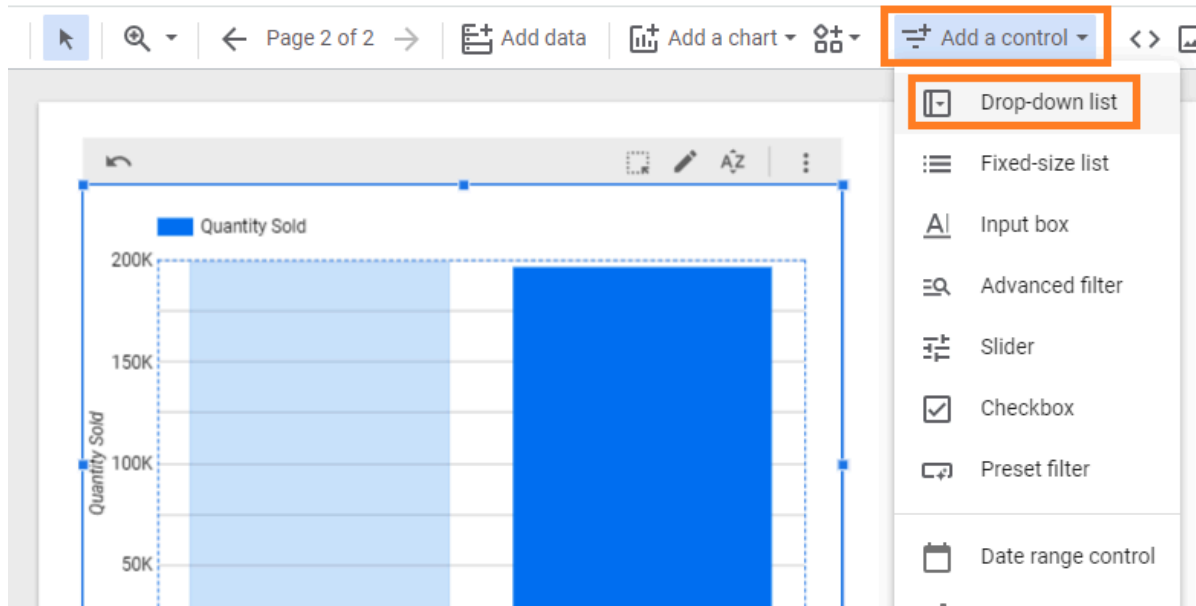
## Exercise 3: Add a drop-down list control and filters to a visualization

### Task 1: Add a drop-down list control

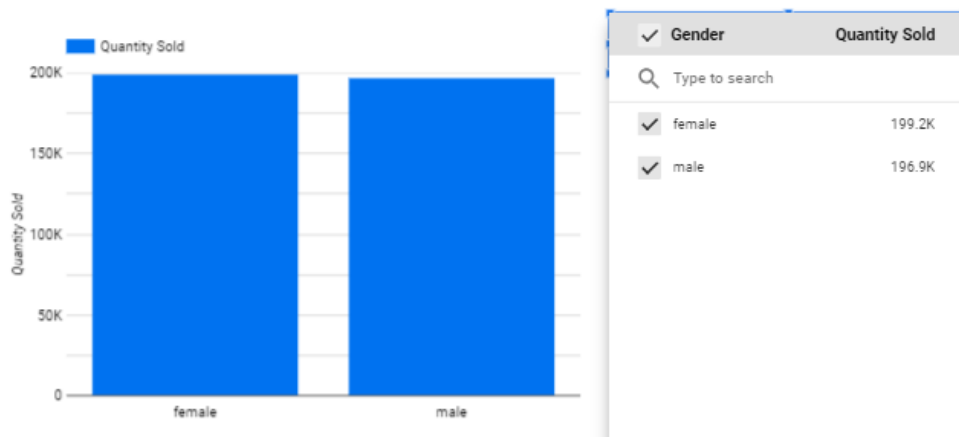
For the bar chart you created in exercise 2, you will now include a drop-down control to enable users to choose the gender from to display the quantity sold.

1. In the toolbar, click **Add control** and select **Drop-down list**.
2. Place it on the right of the chart.





3. Once the control has updated, click on it to see its appearance.



## Task 2: Add filters

1. In the main menu, click **Page**, and then click **New page**.
2. In the toolbar, click **Add a chart**, then from the **Line** section, select the **Combo chart** and place it on the top left of the canvas.
3. In the **SETUP** tab of the **Chart** properties pane, remove the existing data source, and then click **Select Data Source**.
4. Select **CustomerLoyaltyProgram.csv** as the data source.

Simple Dashboard

File Edit View Insert Page Arrange Resource Help

Reset Share View

Page 3 of 3 Add data Add a chart Add a control Pause updates

1 Add a new page

2 Select Combo line chart

3 Select data source

Chart

SETUP STYLE

Data source

BLEND DATA

Date Range Dimension

Add dimension

Dimension

Drill down

Breakdown Dimension

Add dimension

Added data sources

Type to search

cust\_loyalty\_table.csv

CustomerLoyaltyProgram.csv

cust\_table.csv

Blended Data (1)

CustomerLoyaltyProgram.csv

Blended data

Blended Data (1)

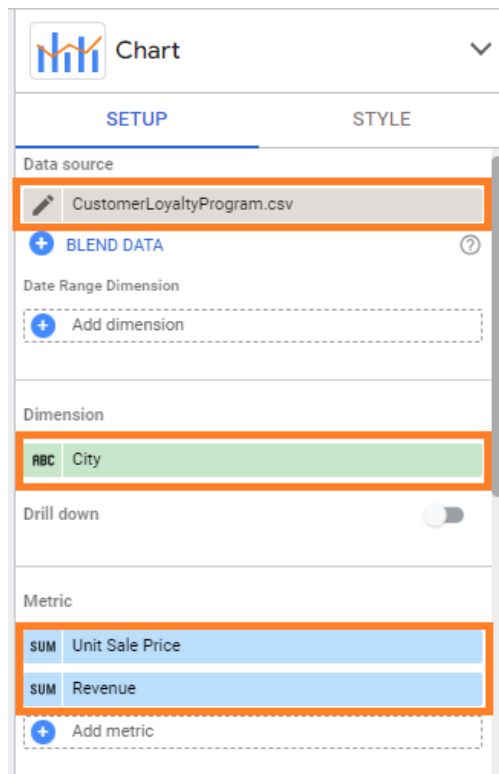
Blended Data (2)

Available data sources

Data

Properties

5. From the data pane, drag **City** to **Dimension** to replace *Gender*.
6. From the data pane, drag **Unit Sale Price** and **Revenue** to **Metric** to replace *Record Count* and *Quantity Sold*.
7. From the data pane, drag **City** to **Sort** to replace *Unit Sale Price*.



Now you'll add a filter to this chart. First you will add a filter for the order year.

8. Select the chart on the canvas and from the **Filter** section of the **Chart** properties pane, click **ADD A FILTER**.

9. In the **Select a field** drop-down list, select **Order Year**, in the **Select a condition** drop-down list, select **Equal to (=)**, then in the **example 1** drop-down list, enter **2016**.

Simple Dashboard

File Edit View Insert Page Arrange Resource Help

Reset Share View

Page 3 of 3 Add data Add a chart Add a control Pause updates

1 2 3

Unit Sale Price Revenue

Filter picker

Order Year filter

Data

Search

CustomerLoyaltyProgram.csv

123 Loyalty Count

123 Loyalty#

Create Filter

CLOSE

Name

CustomerLoyaltyProgram.csv

Include

123 Order Year

Equal to (=)

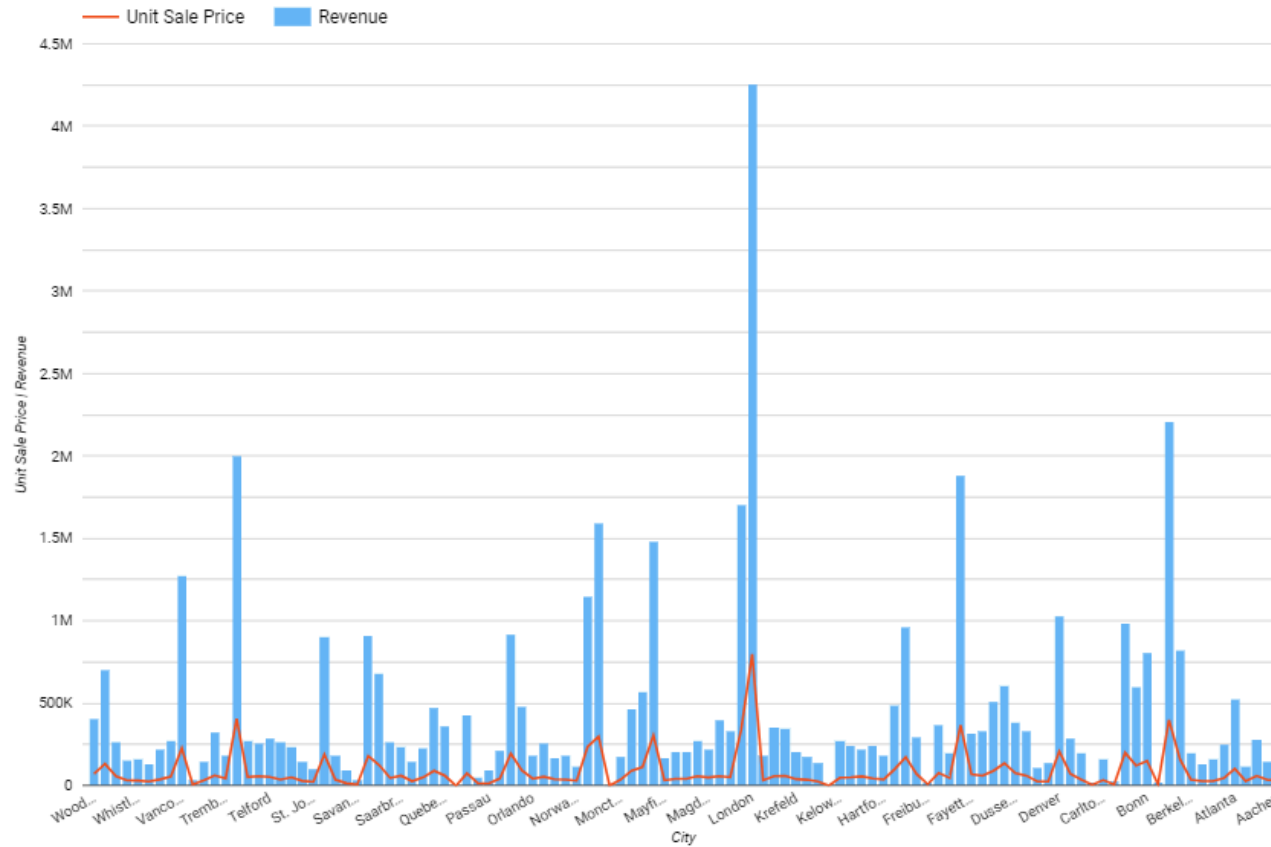
2016

OR

AND

10. Click **SAVE**.

When your chart updates, it should look similar to the image below.



Now you'll exclude a country from the visualization by using a filter.

11. Select the chart on the canvas and from the **Filter** section of the **Chart** properties pane, click **ADD A FILTER**, and then click **CREATE A FILTER**.

12. In the **Include** drop-down list, select **Exclude** instead, in the **Select a field** drop-down list, select **Country**, in the **Select a condition** drop-down list, select **Equal to (=)**, then in the **example: value** drop-down list, enter **Canada**.

Create Filter

✕ CLOSE

Name

CustomerLoyaltyProgram.csv

Exclude



Country



Equal to (=)

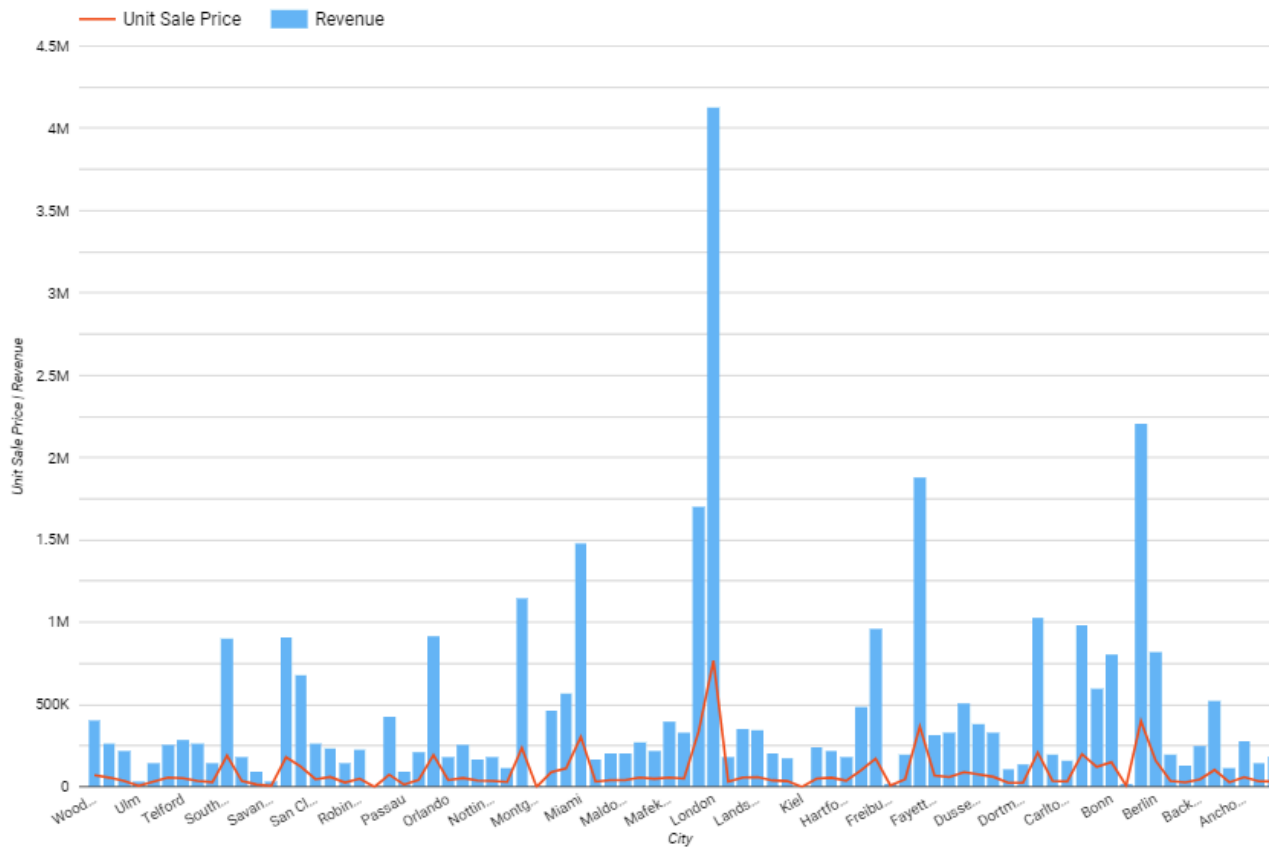


Canada

OR

AND

13. Click **SAVE**.

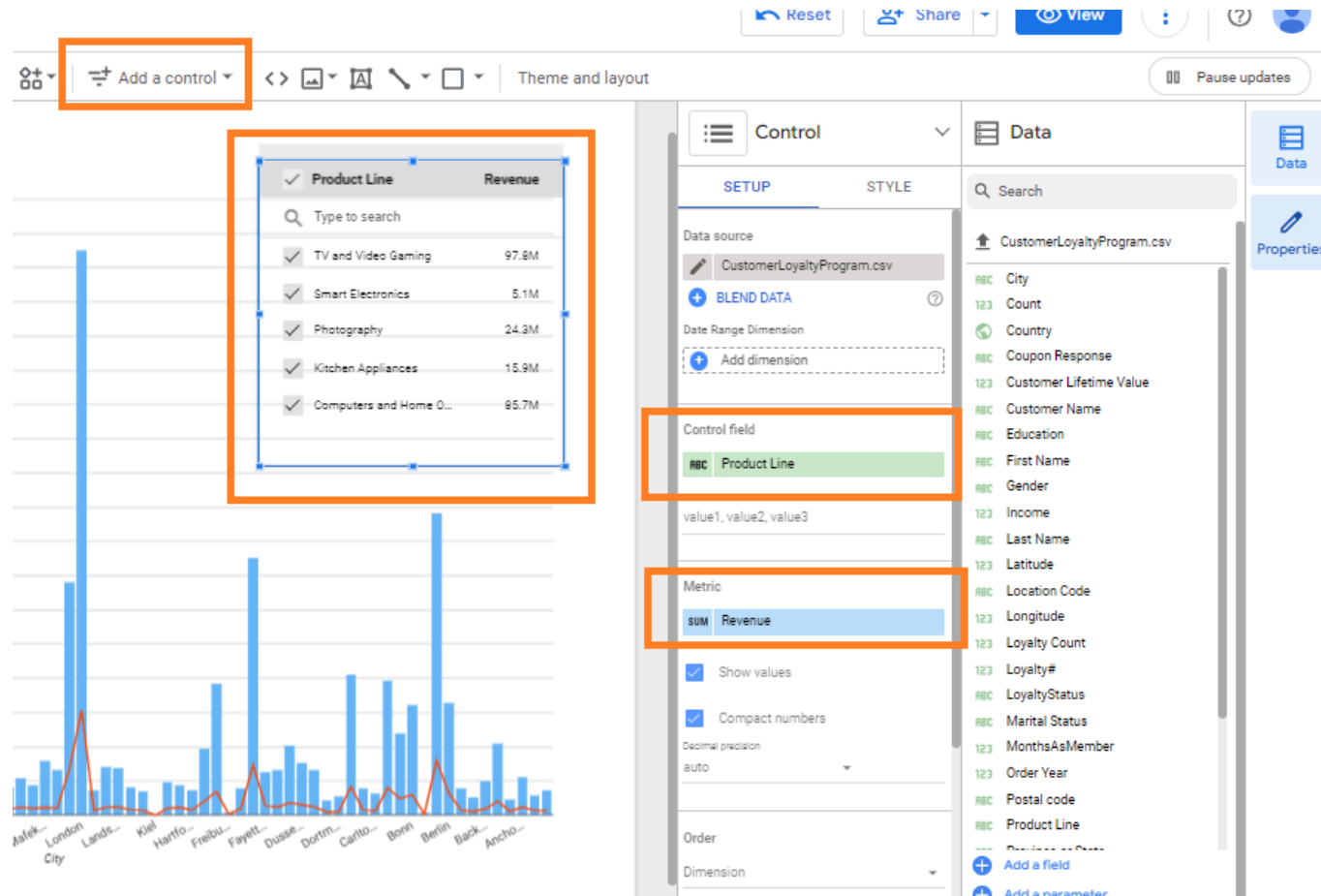


Note: These filters can be used by the report maker and are not visible to the user.

Now you will provide a control to the report viewer, so that they can select the product line for this chart.

14. In the toolbar, click **Add a control**, select **Fixed-size list** and place it above the combo chart.

15. In the **Control** properties pane on the right, from the **Data** field, drag **Product Line** to **Control field** and drag **Revenue** to **Metric**.



Now the user can easily find out unit cost and revenue based on different product line categories by City.

16. In the top right of the page, click **View** to see how this control will appear for the end user.

17. In the control, select the checkbox for **Smart Electronics** only, then hover over the chart to view the different values for different cities. In the image below, the values of unit sale price and revenue are shown for the city of *Norwalk*.



Feel free to create different charts and include more controls.

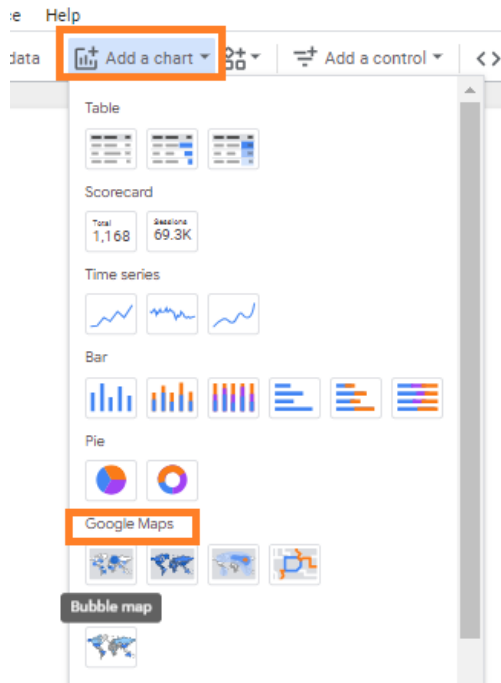
## Exercise 4: Add a bubble map, a heatmap, and a treemap

### Task 1: Add a bubble map

You can display the quantity sold per country with the help of a Google Maps chart.

1. In the main menu, click **Page**, and then click **New page**.
2. On page 4, in the toolbar, click **Add a chart**, in the **Google Maps** section, select **Bubble map** and position it on the canvas.



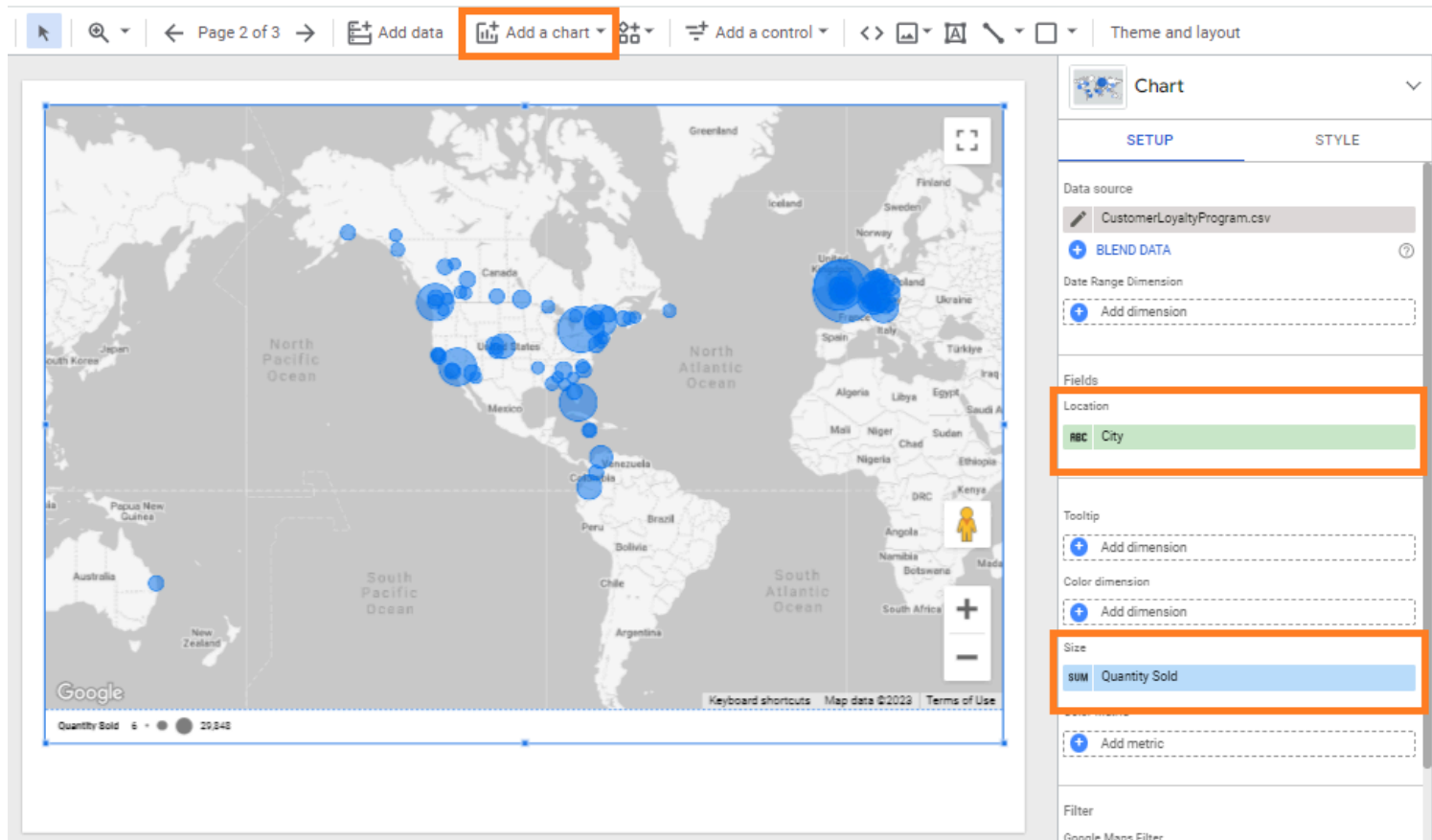


Looker Studio will automatically pick *Country* as the **Location**.

3. From the data pane, drag **City** to **Location** to replace *Country*.

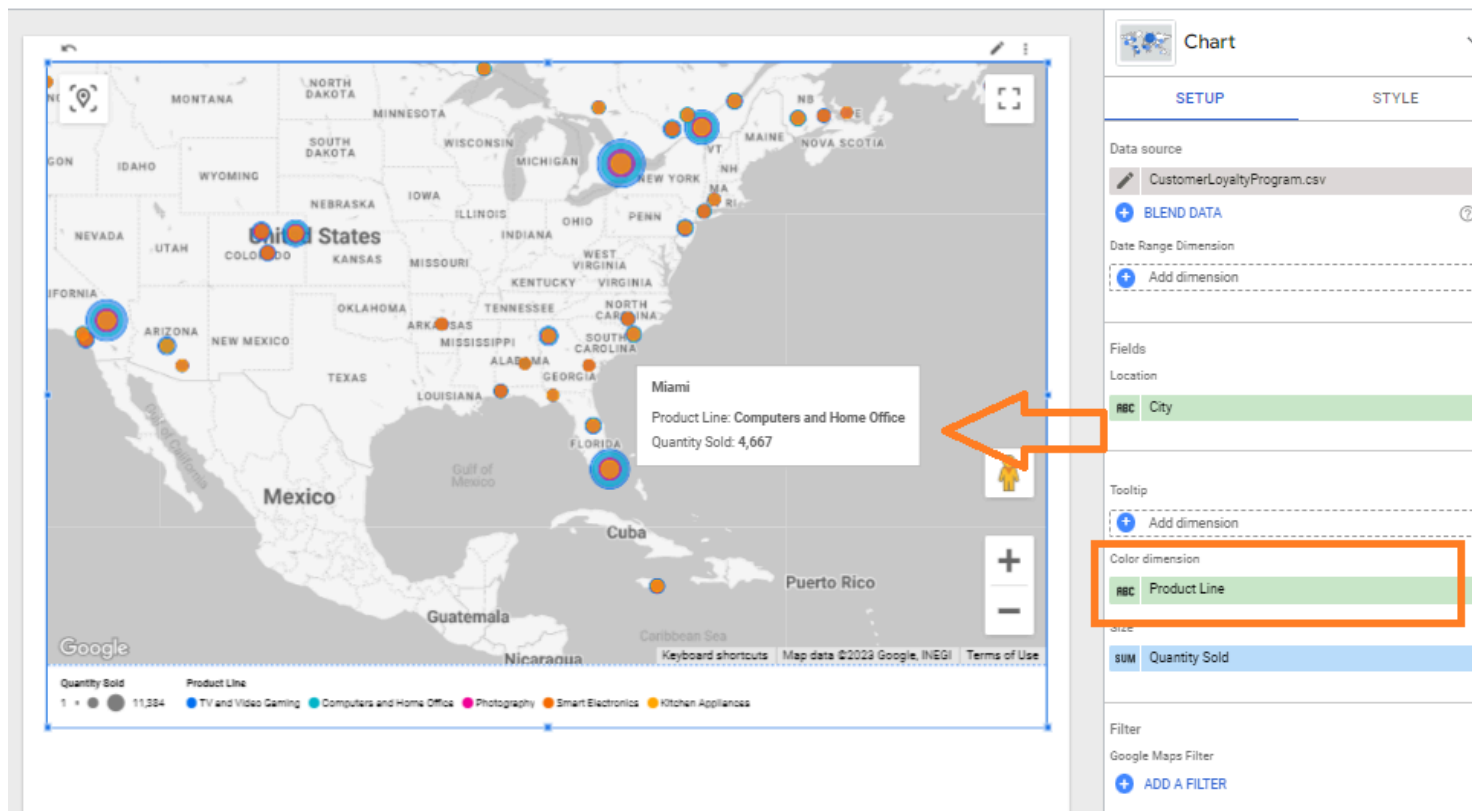
4. From the data pane, drag **Quantity Sold** to the **Size** metric.

Your bubble chart should look similar to the image below.



5. From the data pane, drag **Product Line** to **Color dimension** and notice the change in the bubbles in your chart.

6. In the bubble chart, either use your mouse wheel or the + button to zoom in towards **Florida**, and hover over the blue outside ring on **Miami** and see the value for the *Computers and Home Office* product line. Then hover over the central orange circle and see the value for the *Kitchen Appliances* product line.



7. Zoom back out.

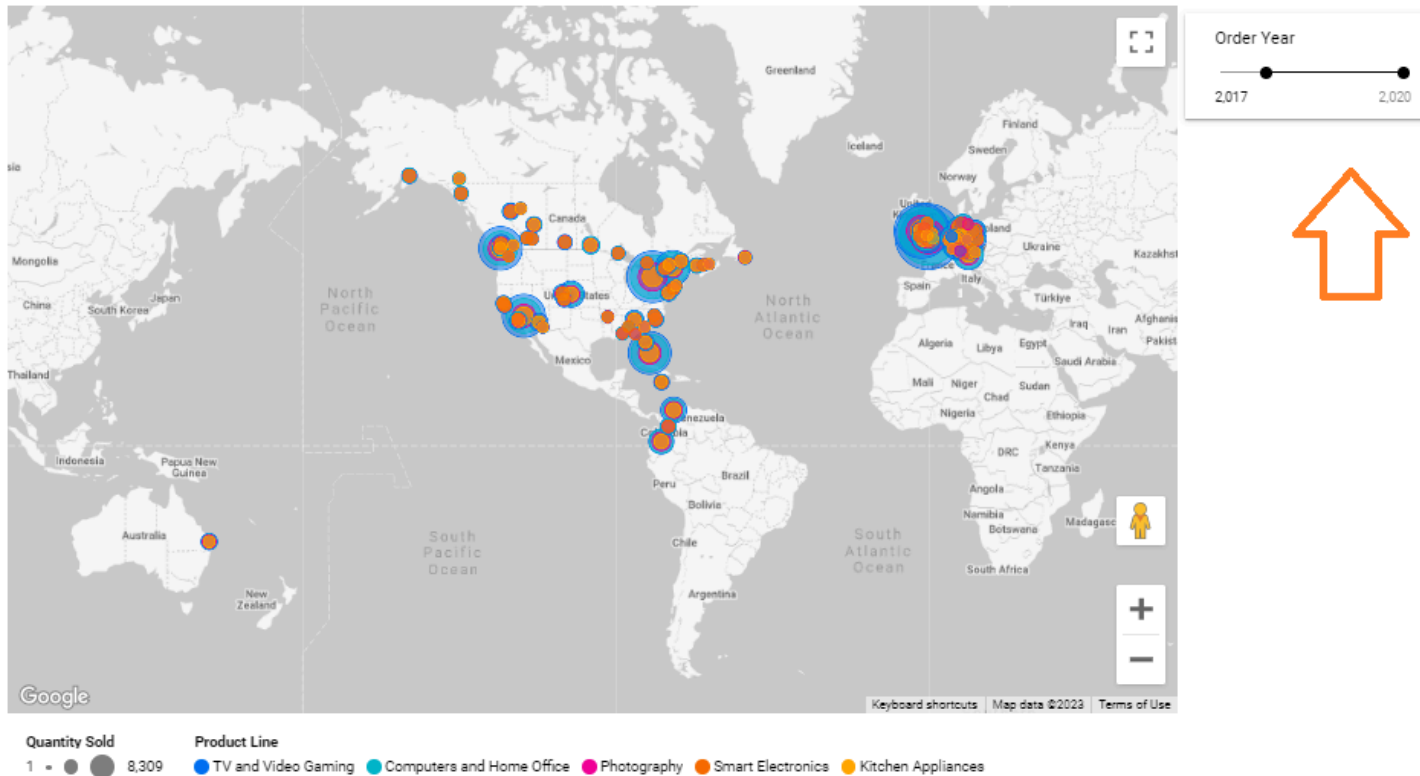
Now you will add a control to the map as a slider to display the *Order Year*.

8. In the toolbar, click **Add a control**, select **Slider** and position it to the right of the bubble map chart.

9. Select the new control and from the **Data** pane, drag **Order Year** to **Control field** in the **Control** properties pane on the right to replace *Loyalty*.

10. In the top right of the page, click **View** to see how this control will appear for the end user. Users will be able to choose a year range on the slider to see the quantity sold in various cities.

11. In the **Order Year** slider control, drag the left end of the slider to the right to show only from **2017** up to **2020**.



12. In the top right of the page, click **Edit** to revert to edit mode.

## Task 2: Add a Heatmap

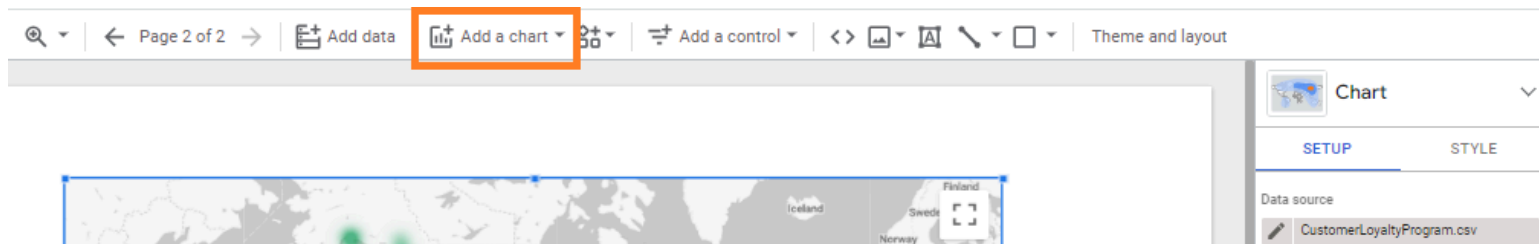
1. In the toolbar, click **Add a chart**, in the **Google Maps** section, select **Heatmap**, and position it under the bubble map chart.

Looker Studio will automatically select *Country* as the **Location**, but you will change it.

2. From the data pane, drag **City** to **Location** to replace *Country*.

3. From the data pane, drag **Quantity Sold** to the **Weight** metric.

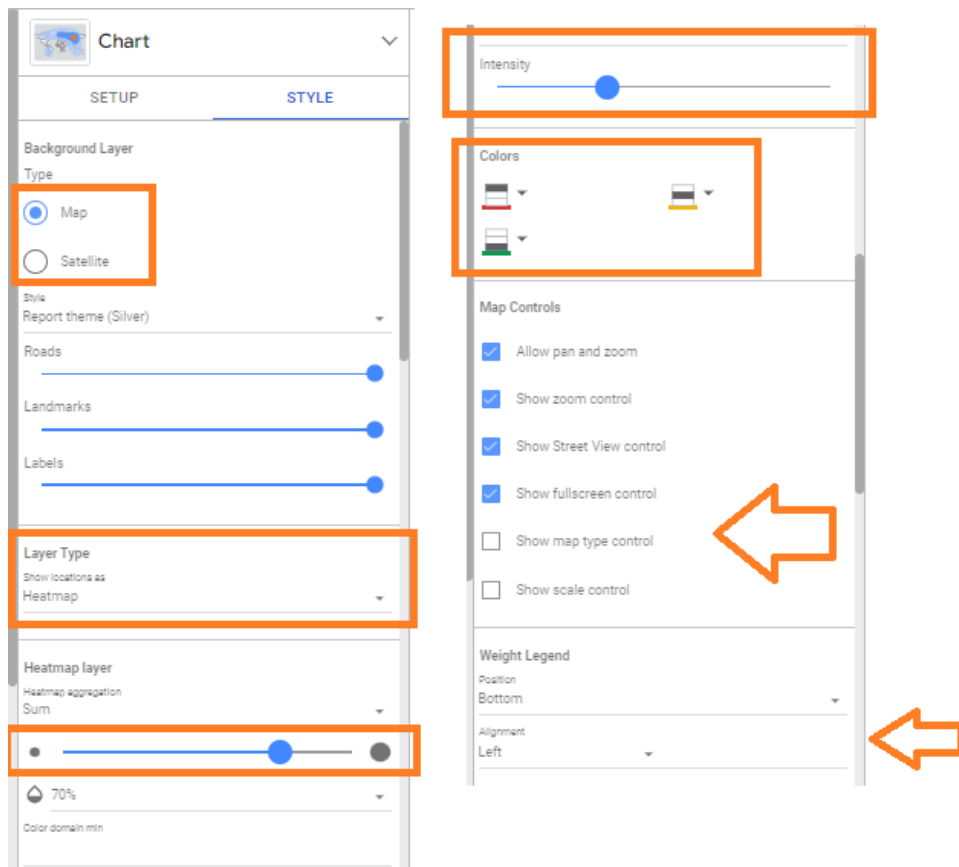
Your heatmap should look similar to the image below.



4. Click the **SETUP** tab.

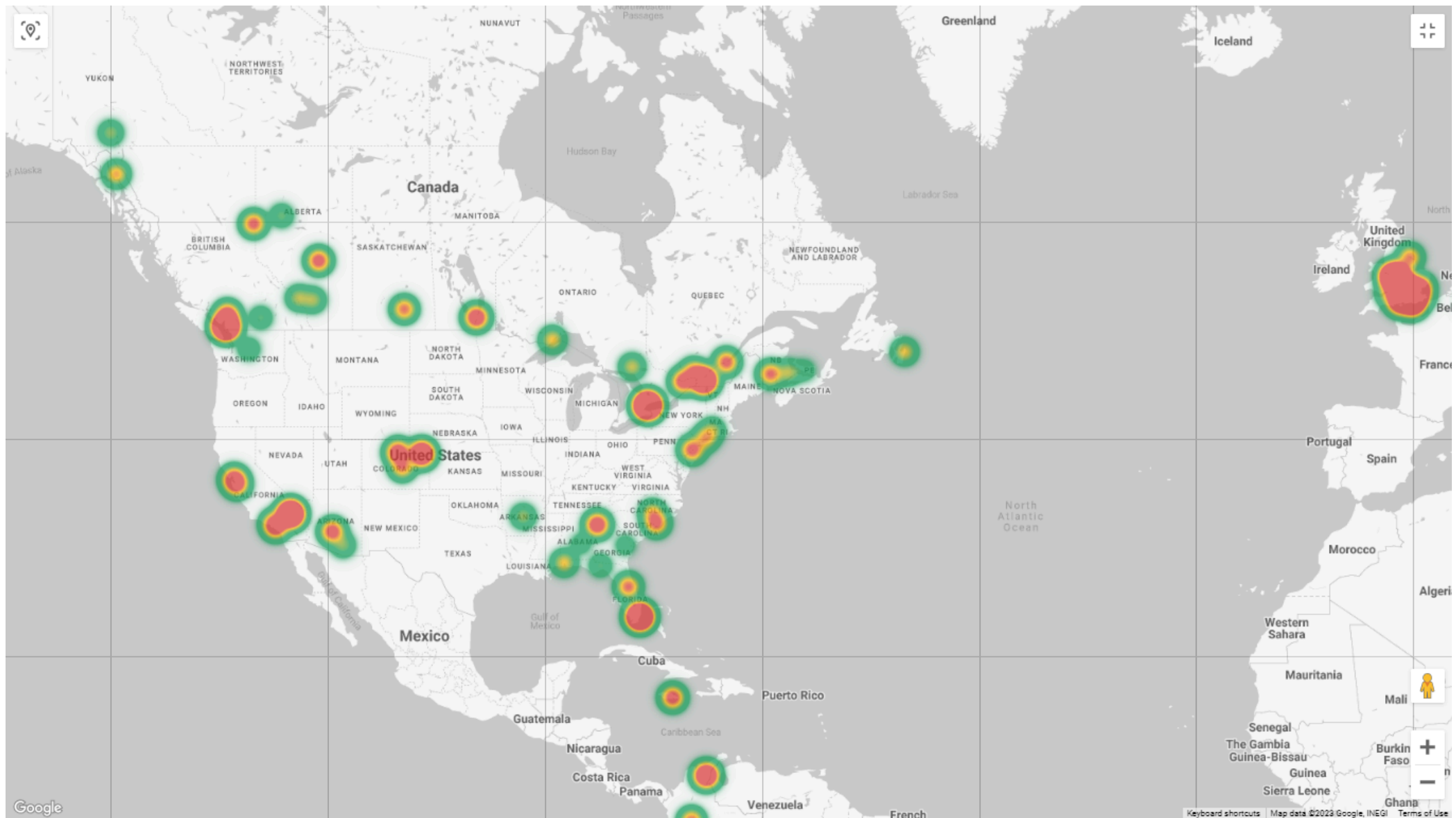
5. Under **Background Layer**, select **Satellite**.

Here you could also modify other aspects of the heatmap's appearance, such as layer type (Heatmap is selected for this map), heatmap layer aggregation, intensity, colors, map controls, and the legend parameters.



6. In the top right of the page, click **View** to see how this control will appear for the end user. Users will be able to zoom in and out on the map.

7. Use the + and - buttons, or your mouse wheel, to zoom in and out on the heatmap.



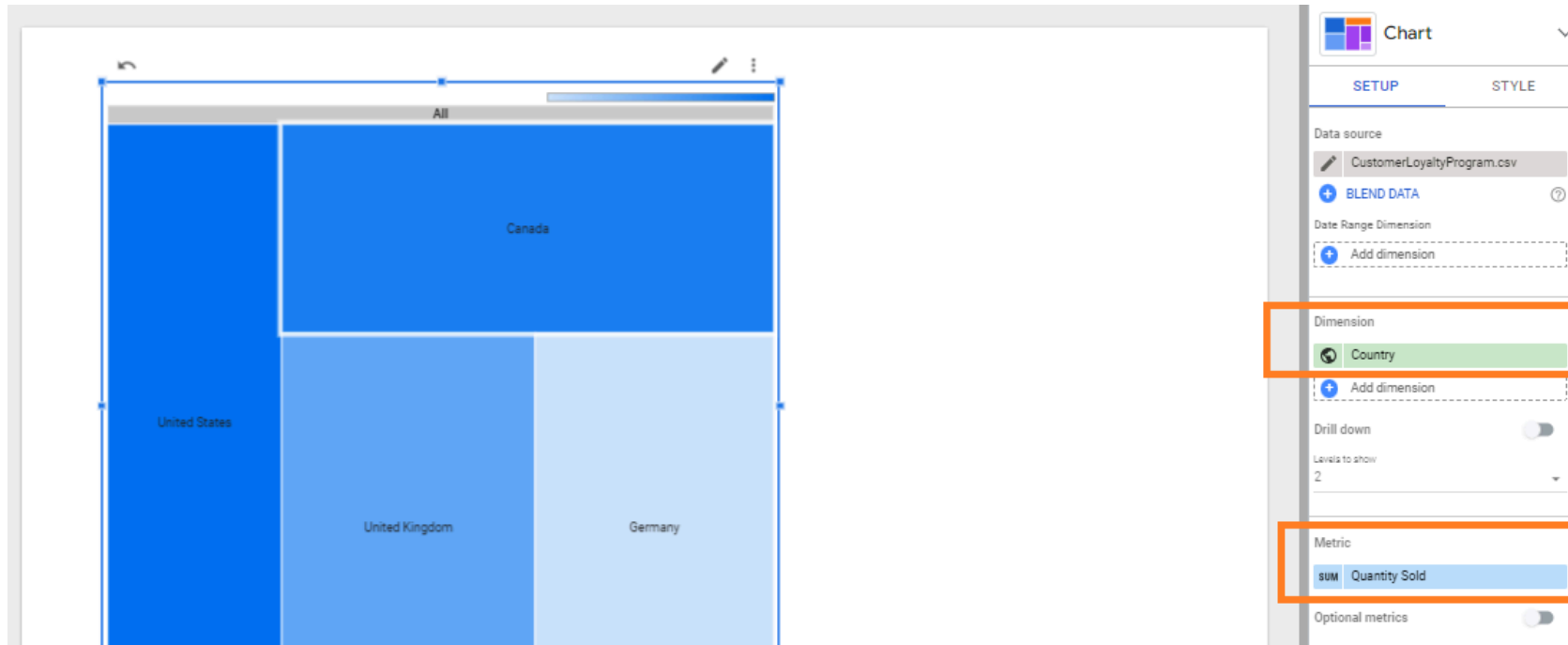
8. In the top right of the page, click **Edit** to revert to edit mode.

**NOTE:** Here we used a geographical Google Maps chart as a heatmap, but there are also options in Looker Studio to create tables and pivot tables with a heatmap, so you could try using them as well.

### Task 3: Add a Treemap

1. In the toolbar, click **Add a chart**, scroll down and select **Treemap**, and position it to the right of the heatmap.

2. Ensure that **Country** is selected as the **Dimension** and **Quantity Sold** is configured as the **Metric**. If they are not, then drag the relevant data fields to those locations in the **Chart** properties pane.



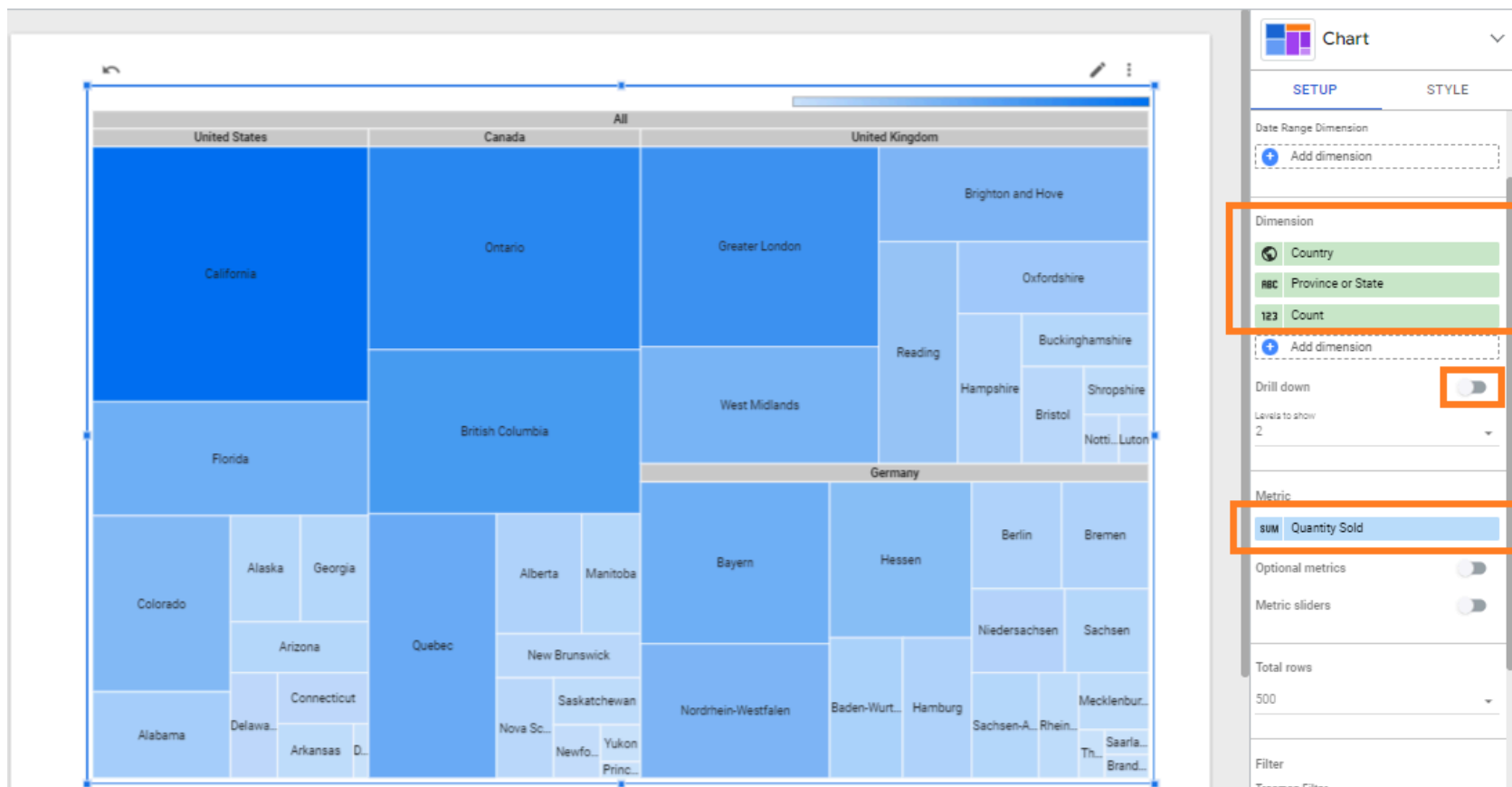
Now you will add some more dimensions to represent hierarchy in the treemap.

3. From the data pane, drag **Province or State** to **Dimension** under *Country*.

4. From the data pane, drag **City** to **Dimension** under *Province or State*.

You can toggle the **Drill down** button to show the country, province, or city levels.





You can also add an optional metric to the treemap chart.

5. In the **Chart** properties pane, under **Metric**, select the **Optional metrics** toggle switch.

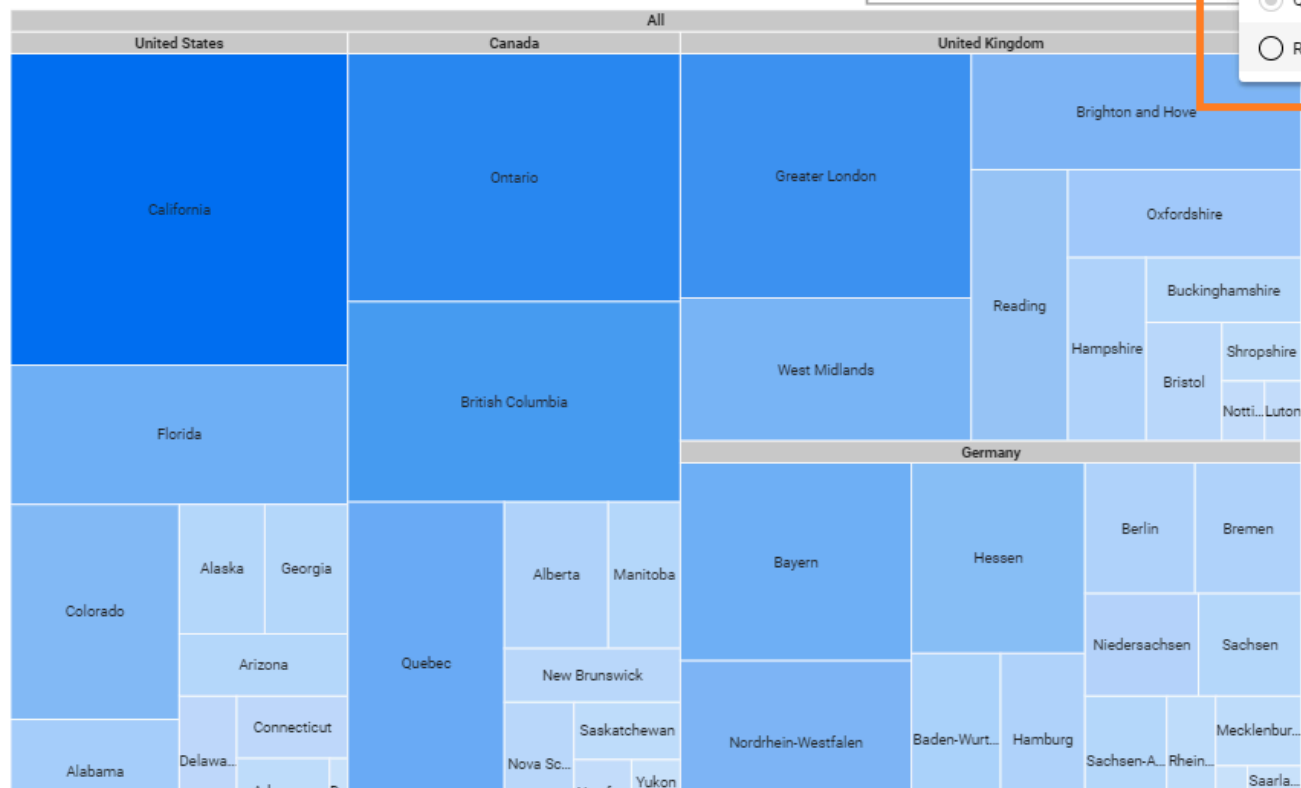
6. From the **Data** pane, drag **Revenue** to **Optional metrics**.

The menu above the chart will show the options to be selected by the user to display the relevant metric.

7. In the top right of the page, click **View** to see how this control will appear for the end user. Users will be able to view the optional metrics in the treemap.

8. Above the treemap, click the **Optional metrics** icon, then select **Revenue**.

9. Hover over the treemap to view the revenue values for each province.



- ☒ Quantity Sold
- ☐ Revenue

**Congratulations! You have completed this Hands-on Lab**

For more help, you can refer to the [Tutorial on Looker Studio by Google](#)

**Author(s)**

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**Changelog**

Date	Version	Changed by	Change Description
2023-09-21	1.0	Dr. Pooja	Initial version created
2023-09-22	1.1	Steve Ryan	ID review and edit
2023-09-25	1.2	Mercedes Schneider	QA review w/edits
2023-09-25	1.3	Dr. Pooja	Included notes on metric on both axis and heatmap
2023-09-27	1.4	Steve Ryan	Second ID pass and title change