

# Fundamentals of Visualization

Labs



JOURNEYTEAM



# Guide to the Visualization Labs

This workbook contains Labs for the JourneyTEAM Fundamentals of Visualization course.

The files associated with the labs can be downloaded from a link that will be sent you in a follow up email.

You will need to download the folder containing the lab files. To do so, follow these steps:

1. Open the class materials link
2. Save the entire folder to a location on your local computer where Power BI Desktop has been installed.
3. Uncompress the folder and store the folder on your computer C: drive (if possible)

The Labs are meant to be done in order; however, for this class, you can work through them in any order.


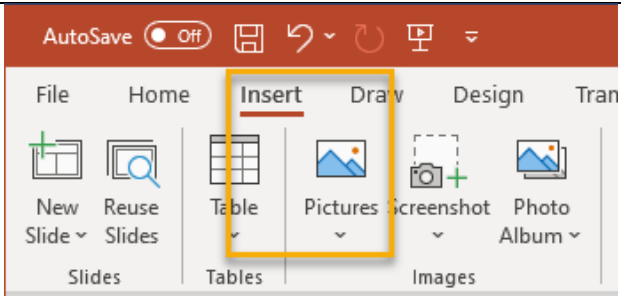
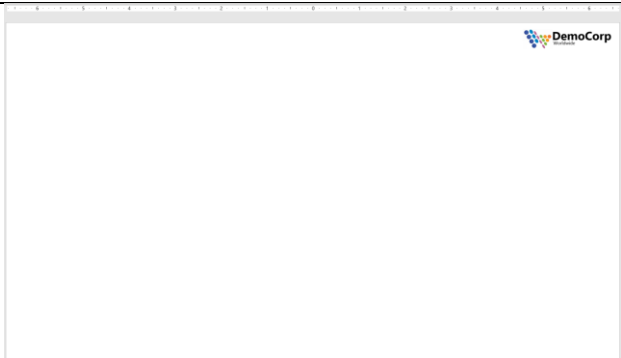
Enjoy the course!

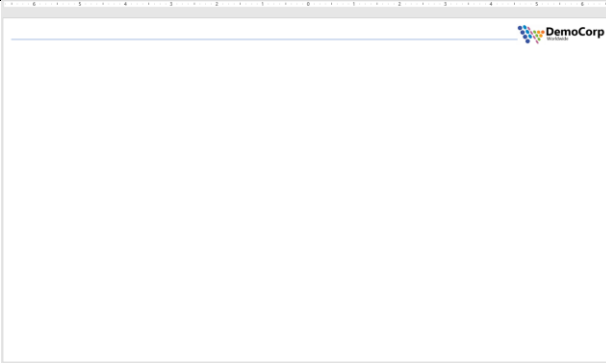
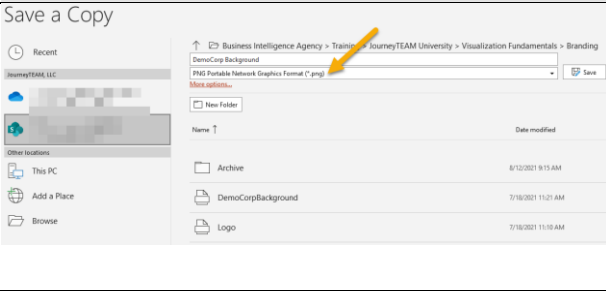
# Lab 1 – Custom Style (Branding & Color Palette)

## *Creating and Applying a Custom Background*

### Required for this Lab:

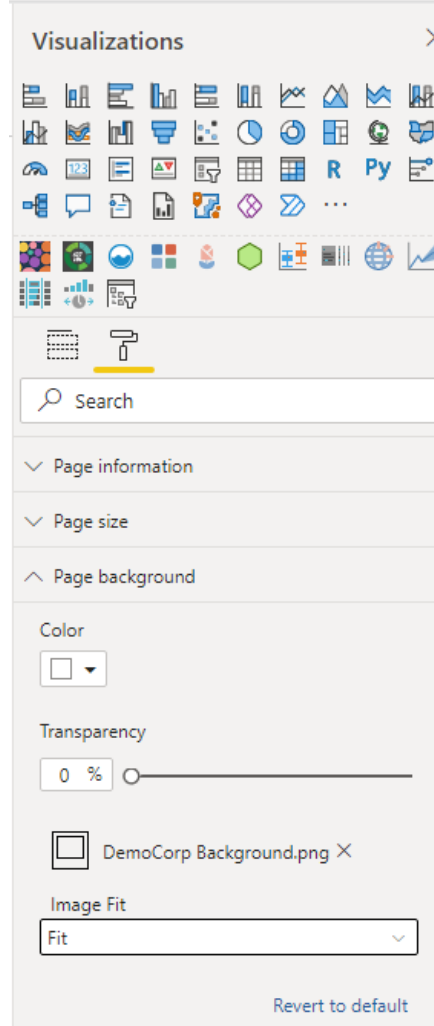
- PowerPoint Application
- Downloaded class files: to the C drive if possible

Instructions	Examples
1. Open a new Power Point Document (presentation)	
2. Remove text boxes on the page	
3. From the Menu Select: Insert > Pictures > This Device ...	
4. Select the Logo.png file from the Branding folder in the course materials	
5. Move the Logo to the top right corner of the Page (resize as desired)	

<p>6. Add a horizontal line to the left of the log near the top of the page</p>	
<p>7. Save as png file – Select File &gt; Save a Copy and fill in the Name as DemoCorp Background and Select the Portable Network Graphics Format (*.png) as the file format.</p> <p>When asked “Which slides do you want to export?” choose “Just This One”.</p>	
<p>8. Open the DataVisualizationLab Power BI file in Power BI Desktop and go to Blank Page</p>	

9. Select Format (roller icon) in the Visualization Pane

- Select Page background
- Set Transparency to 0%
- Select the file DemoCorpBackground.png from the course files or the file you created above
- Change the Image Fit value to “Fit”



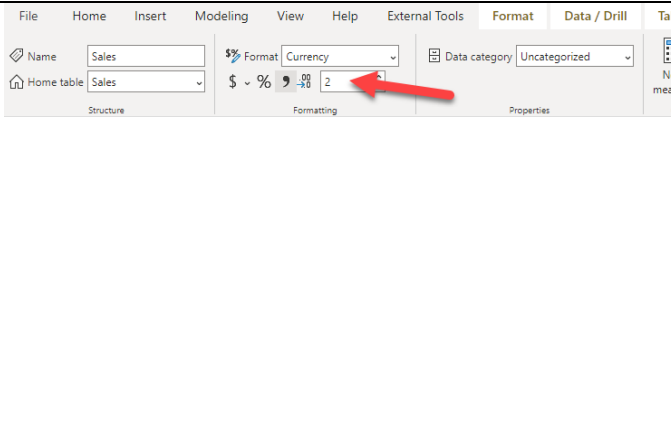
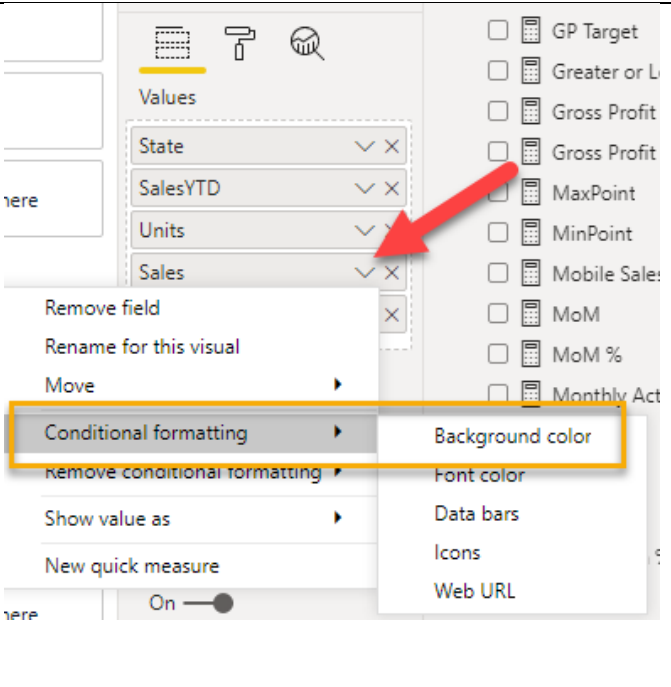
## Lab 2 – Focused

### *Creating Focus in your reports and dashboards*

#### Required for this Lab:

- Downloaded class files: Reports( DataVisualizationLab.pbix )

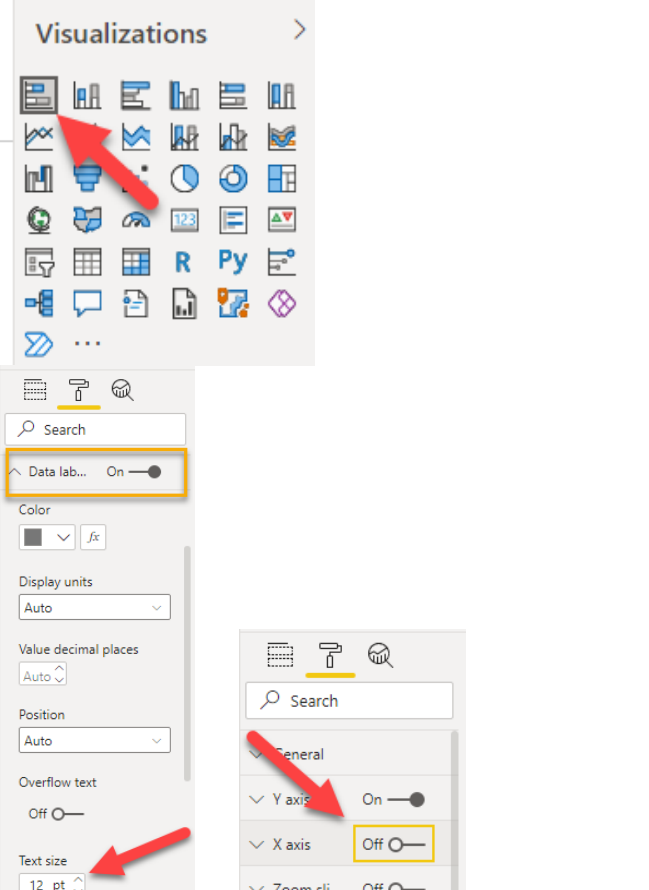
#### LAB 2 - EXERCISE 1

<b>Remove the decimal places on the SalesYTD and Sales fields.</b>	<b>1-make sure you select the visual on the L2 – Exercise 1 page</b> <b>2-click on the Sales YTD field in the fields panel</b> <b>3-change the value of the decimal places from 2 to 0</b> <b>4-repeat for Sales field</b>	
<b>Replace the gradient background color on the sales column.</b>	<b>5-click on the down arrow next to the Sales field</b> <b>6-select Conditional formatting &gt; Background color</b> <b>7-change the Minimum color to white and the Maximum color to light green</b> <b>8-add a background color for the Avg Per Sales field – use white for the Minimum color and light blue for the Maximum color</b>	

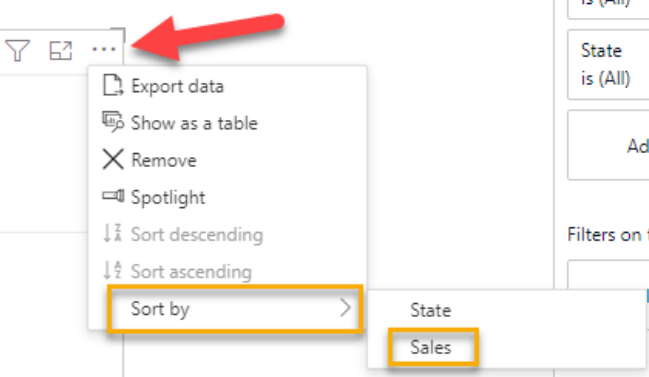
		<div>Background color - Sales</div> <div><div>Format by</div><div>Color scale</div><div>Apply to</div><div>Values only</div><div>Based on field</div><div>Sales</div><div>Default formatting</div><div>As zero</div><div>Minimum</div><div>Lowest value</div><div>Enter a value</div><div>Maximum</div><div>Highest value</div><div>Enter a value</div><div><input type="checkbox"/> Diverging</div></div>
Add a data bar to the Units field	<div>9-click on the down arrow next to the Units field</div> <div>10-select Conditional formatting &gt; Data bar</div> <div>11-change the Positive bar color to light gray and the Bar direction to "Right to left"</div>	<div><div>Units</div><div>Remove field</div><div>Rename for this visual</div><div>Move</div><div>Conditional formatting</div><div>Remove conditional formatting</div><div>Don't summarize</div><div>Sum</div><div>Average</div><div>Background color</div><div>Font color</div><div>Data bars</div><div>Icons</div><div>Web URL</div></div> <div>Data bars - Units</div> <div>Format cells with bars based on their values.</div> <div><input type="checkbox"/> Show bar only</div> <div><div>Minimum</div><div>Lowest value</div><div>Enter a value</div><div>Maximum</div><div>Highest value</div><div>Enter a value</div></div> <div><div>Positive bar</div><div></div><div>Negative bar</div><div></div></div> <div><div>Bar direction</div><div>Right to left</div><div>Axis</div><div></div></div>
Change the sort column to explore relationships.	12-click on the Avg Per Sale column header to change the sort order and compare the Avg Per Sale values to the Sales values. Try changing the sort on other columns.	

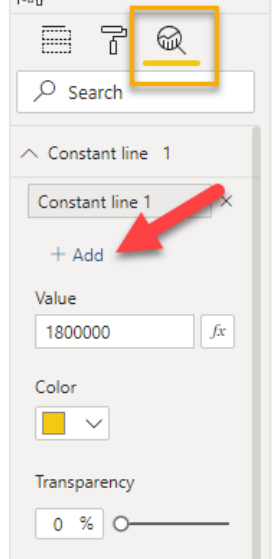
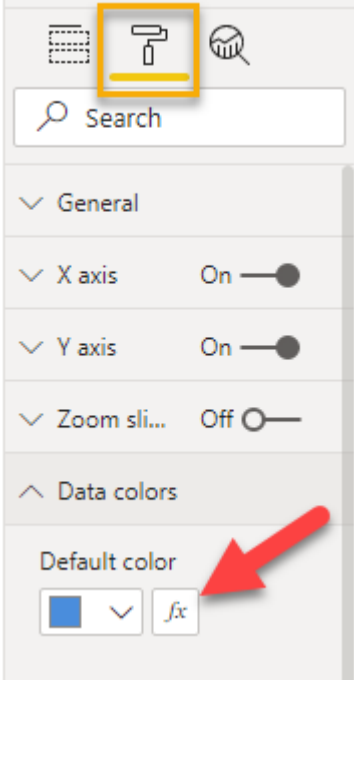


## LAB 2 - EXERCISE 2

<p>Convert a column visual to a stacked bar visual</p>	<ol style="list-style-type: none"> <li>1-make sure you select the visual on the L2 – Exercise 2 page</li> <li>2-click on the Stacked bar visual icon</li> <li>3-under the format menu in the visualization pane, turn the data label on and set the font size to 12 pt</li> <li>4-turn the X axis off to remove the axis labels</li> </ol>	 <p>The screenshot shows the 'Visualizations' pane on the left with the 'Stacked bar' chart icon highlighted by a red arrow. On the right, the 'Format' pane is open, showing the 'Data labels' toggle set to 'On' and the 'Text size' set to '12 pt', both highlighted with red arrows. Below, the 'X axis' toggle is set to 'Off', also highlighted with a red arrow.</p>
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## LAB 2 - EXERCISE 3

<p>Sort the columns by sales instead of by state</p>	<ol style="list-style-type: none"> <li>1-make sure you select the visual on the L2 – Exercise 3 page</li> <li>2-click on the three dots (elipses) in the top right corner of the visual</li> <li>3-select Sort by Sales</li> </ol>	 <p>The screenshot shows a context menu with options like 'Export data', 'Show as a table', 'Remove', 'Spotlight', 'Sort descending', and 'Sort ascending'. The 'Sort by' option is highlighted with a red arrow and a yellow box. A sub-menu is open showing 'State' and 'Sales', with 'Sales' selected and highlighted with a yellow box.</p>
<p>Add a constant threshold line</p>	<ol style="list-style-type: none"> <li>4-click on the Analysis icon in the visualization panel</li> </ol>	

	<p>5-click on the +Add button</p> <p>6-enter 1800000 in the Value field</p> <p>7-change the color to yellow</p> <p>8-set the Transparency to 0%</p>	
<p>Change the bar color of those bars that are below the threshold line</p>	<p>9-click on the Format icon in the visualization panel</p> <p>10-open the Data colors menu and click on the fx button next to the Default color</p> <p>11-change Format by to Rules</p> <p>12-use the Based on field to select Sales from the Sales table</p> <p>13-click on the +New rule button to add a second line to the form and complete all the values as indicated in the example below</p>	

Default color - *Data colors*

Format by  
 Rules ▼

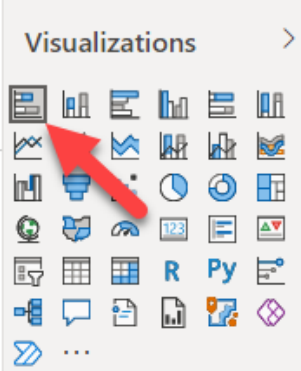
Based on field  
 Sales ▼

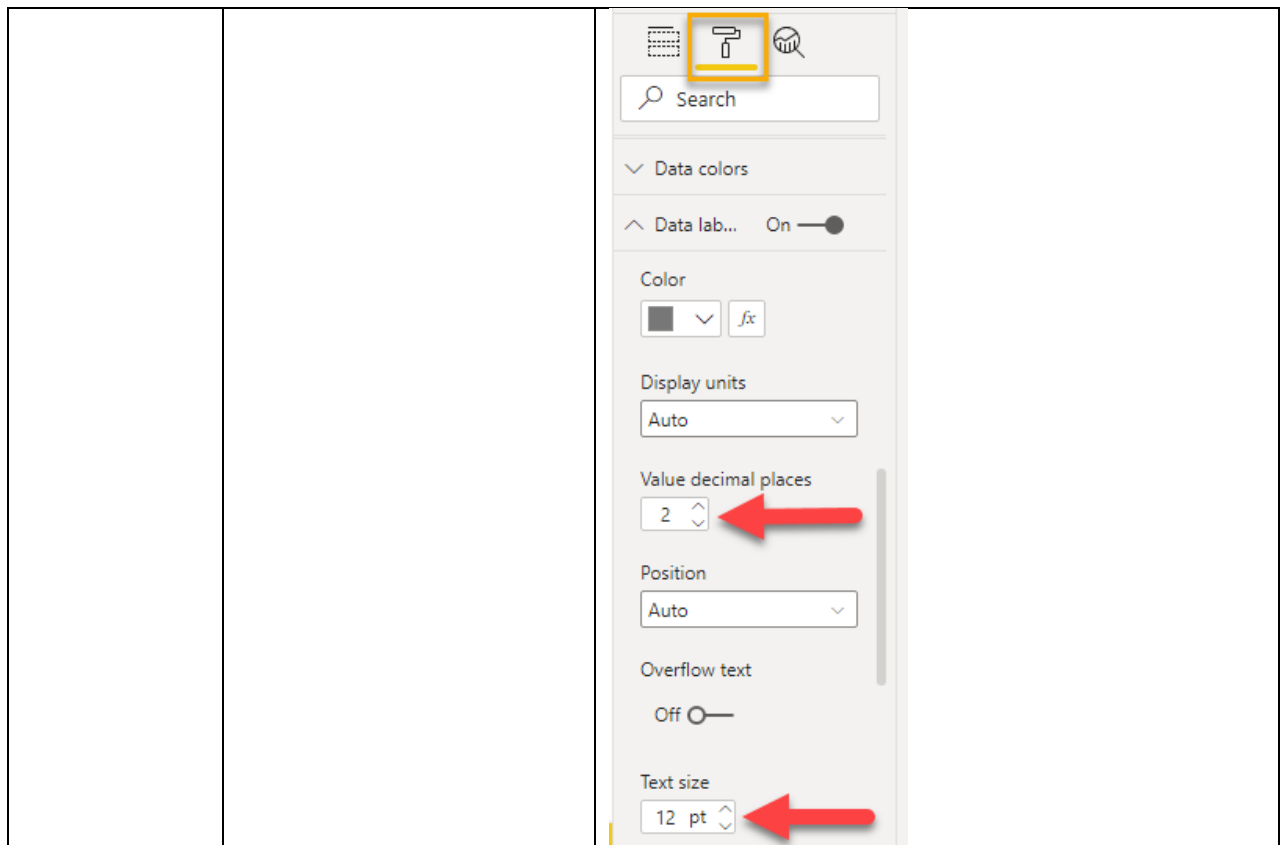
Rules

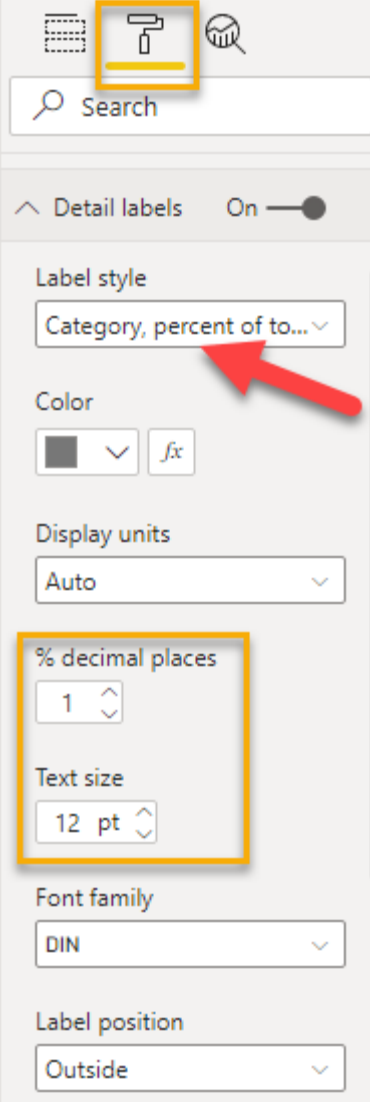
Reverse color order + New rule

If value	is greater than or equal to ▼	1800000	Number ▼	and	is less than ▼	9999999	Number ▼	then	Blue ▼	↑ ↓ ×
If value	is greater than or equal to ▼	0	Number ▼	and	is less than ▼	1800000	Number ▼	then	Grey ▼	↑ ↓ ×

## LAB 2 - EXERCISE 4

<p>Replace a donut chart (just like a pie chart with a hole in it) with a more effective visualization</p>	<ol style="list-style-type: none"> <li>1-select the donut chart visual on the left side of the L2 – Exercise 4 page</li> <li>2-click on the Stacked bar visual icon to convert the donut chart to a bar chart</li> <li>3-use the format menu in the visualization pane to turn off the X axis</li> <li>4-use the drop down on the Y axis to change the Text size to 12 pt</li> <li>5- Turn Data labels on and make the following changes to the Data labels: change the Value decimal places from auto to 2; change the Text size to 12 pt</li> </ol>	 <p>The screenshot shows the 'Visualizations' pane in Power BI. A red arrow points to the 'Stacked bar' chart icon, which is highlighted. Other icons like 'Line', 'Area', 'Pie', and 'Donut' are also visible in the pane.</p>
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<p>Making a donut chart better (if you must)</p>	<ol style="list-style-type: none"> <li>1-select the donut chart visual on the right side of the L2 – Exercise 4 page</li> <li>2-click the Format icon in the Visualization pane</li> <li>3-in the Detail labels drop down, select the Category, percent of total option</li> <li>4-change the % of decimal places from auto to 1</li> <li>5-change the Text size to 12 pt</li> <li>6- notice that you can change the Lable position from Outside to Inside as required</li> </ol> <p>Note: compare the two visualizations. You will notice that it is much easier to compare one channel to another when displayed in a sorted bar chart than in a donut or pie chart.</p>	
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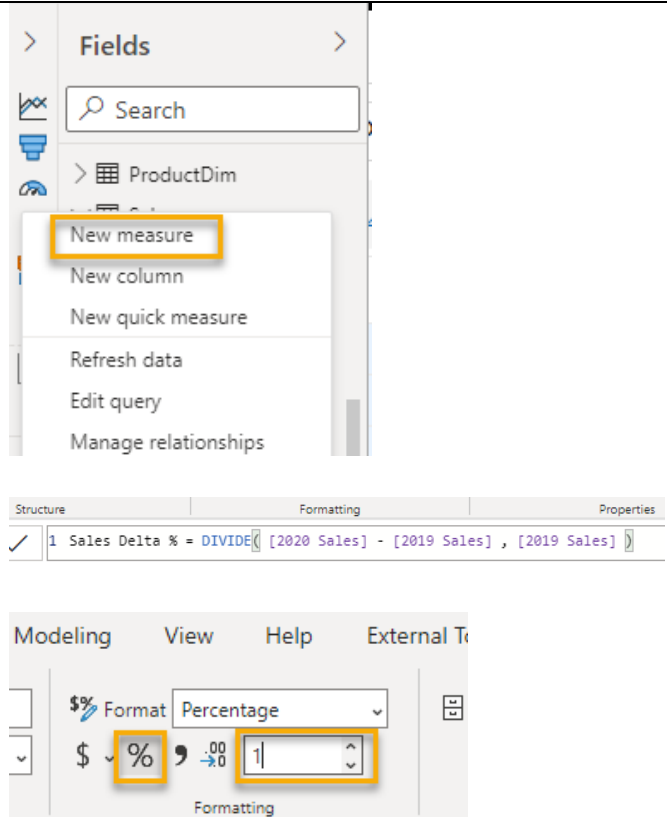
## Lab 3 – Simple Lab

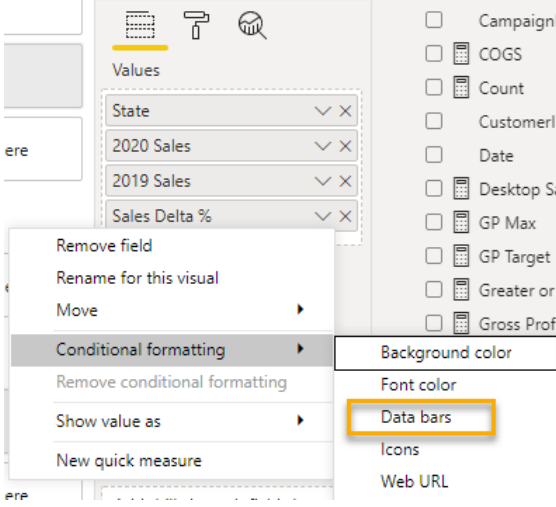
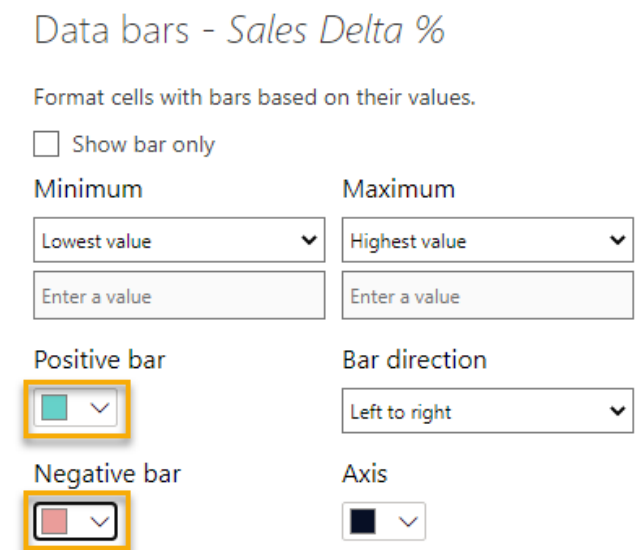
*Keep your report simple so that a non-expert can understand*

Required for this Lab:

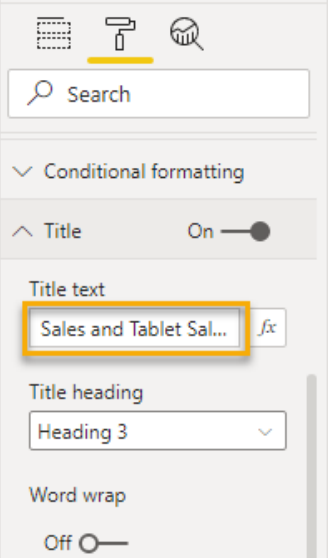
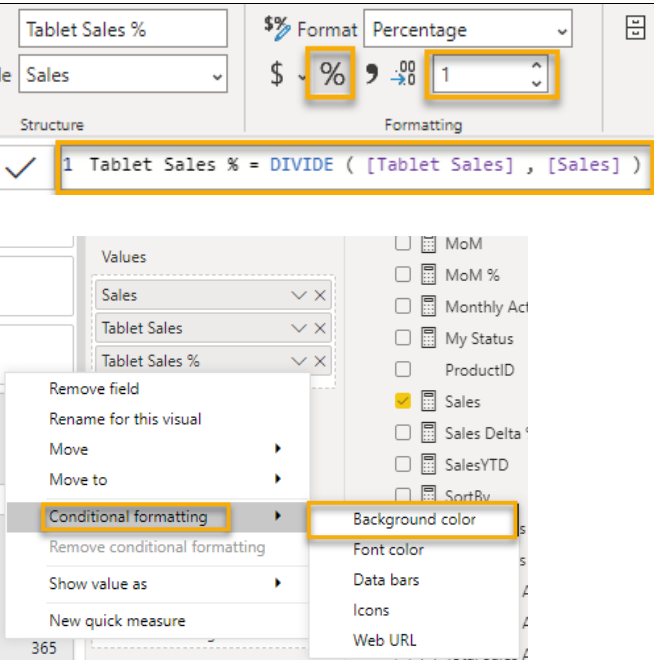
- Downloaded class files: Reports( DataVisualizationLab.pbix )

### LAB 3 - EXERCISE 1

<p>Adding comparison to enhance understanding</p>	<p>1-click on the L4 Exercise 1 page 2-right click over the ellipses (3 dots) next to the Sales table in the Fields list and select New Measure 3-enter the following into the formula bar: Sales Delta % = <code>DIVIDE([2020 Sales] - [2019 Sales] , [2019 Sales] )</code> 4-add the new measure (Sales Delta %) to the Top 20 State Sales visual (make sure the visual is selected)</p>	
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	<p>5-add conditional bars to the Sales Delta % field</p> <p>Use the dropdown next to the Sales Delta % field in the visualization pane. Select Conditional formatting &gt; Data bars.</p>	
	<p>6- change the Positive bar to a light green and the Negative bar to a light red</p>	

## LAB 3 - EXERCISE 2

<p>Simple clear titles</p>	<p>1-click on the L4 Exercise 2 page</p> <p>2-select the visual (matrix)</p> <p>3-click on the Format icon in the Visualization pane</p> <p>4-go to the Title dropdown and change the Title heading to something more understandable: i.e. "Total Sales vs Tablet Sales"</p> <p><i>Often the default value in a title is not simple and needs to be modified. It's not required to have every attribute in the title.</i></p>	
<p>Add a comparison value that can quickly identify the most interesting information</p>	<p>5-create a new measure Tablet Sales % in the Sales table</p> <p><b>Tablet Sales % = DIVIDE ( [Tablet Sales] , [Sales] )</b></p> <p>6 – change the format of the Tablet Sales % measure to a percent with 1 decimal place</p> <p>7- add the Tablet Sales % to the matrix after the Tablet Sales field</p>	



	<p>8-use the dropdown next to the Tablet Sales % to select Conditional formatting &gt; Background color</p> <p>9-change the Minimum color to white and the Maximum color to light blue</p>	<p>Background color - <i>Tablet Sales %</i></p> <p>Format by <input type="text" value="Color scale"/> Apply to <input type="text" value="Values only"/></p> <p>Based on field <input type="text" value="Tablet Sales %"/> Default formatting <input type="text" value="As zero"/></p> <p>Minimum <input type="text" value="Lowest value"/> <input type="text" value="Enter a value"/> <input type="text" value="Light blue"/></p> <p>Maximum <input type="text" value="Highest value"/> <input type="text" value="Enter a value"/> <input type="text" value="White"/></p> <p><input type="checkbox"/> Diverging</p>
<p>Remove unnecessary totals from the report</p>	<p>10-click on the Format icon in the Visualization pane</p> <p>11-drop down the Subtotals menu and turn off the Row subtotals and the Column subtotals</p> <p>12-adjust the visual size to remove white space and center in the page</p>	

	<p>6- change the Positive bar to a light green and the Negative bar to a light red</p>	<div><h3>Data bars - <i>Sales Delta %</i></h3><p>Format cells with bars based on their values.</p><div><input type="checkbox"/> Show bar only</div><div><div><div>Minimum</div><div>Lowest value ▾</div><div>Enter a value</div></div><div><div>Maximum</div><div>Highest value ▾</div><div>Enter a value</div></div></div><div><div><div>Positive bar</div><div><div> ▾</div></div></div><div><div>Bar direction</div><div>Left to right ▾</div></div><div><div><div>Negative bar</div><div><div> ▾</div></div></div><div><div>Axis</div><div> ▾</div></div></div></div></div>
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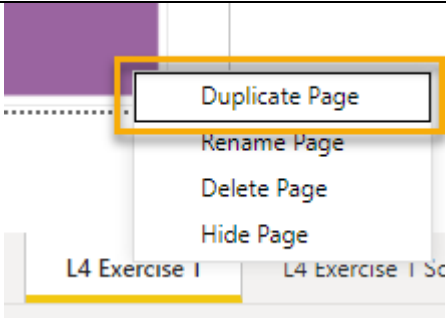
## Lab 4 – Organized Lab

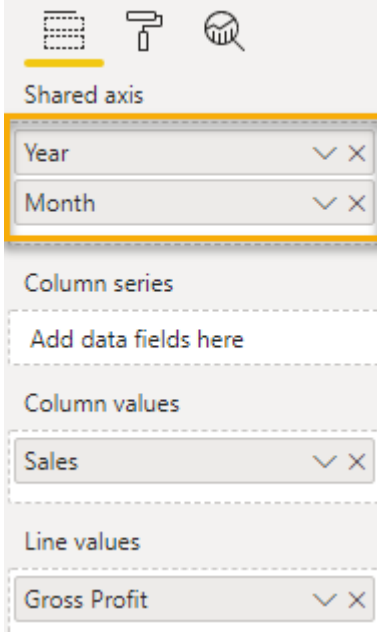
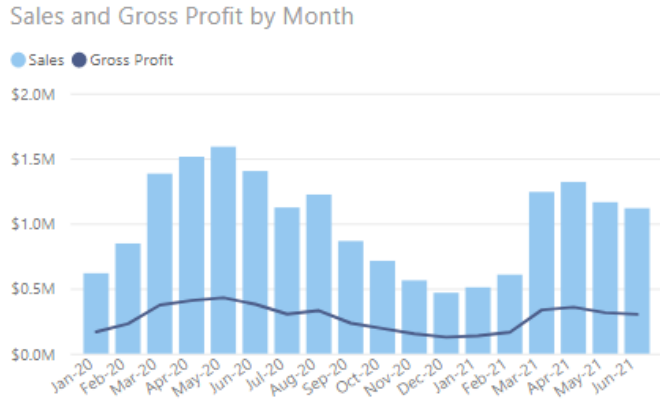
*Organize your reports to enhance cognitive understanding*

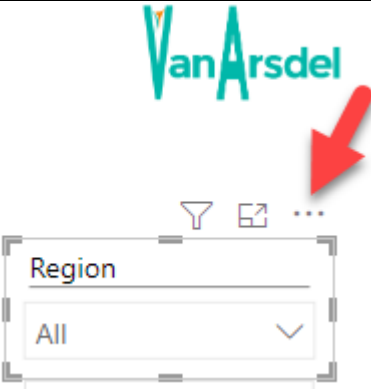
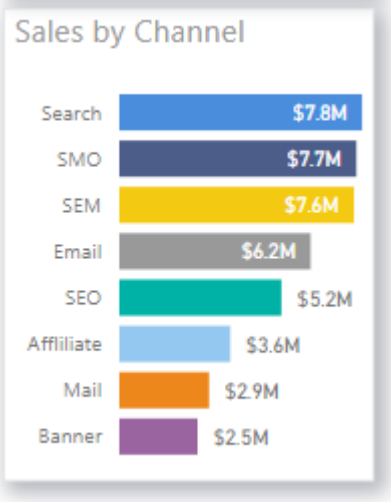
Required for this Lab:

- Downloaded class files: Reports( DataVisualizationLab.pbix )

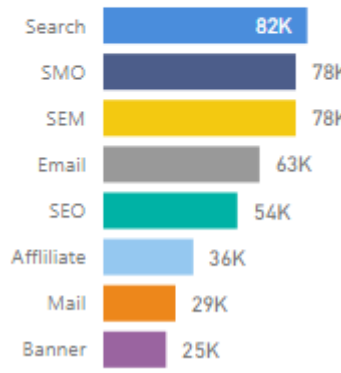
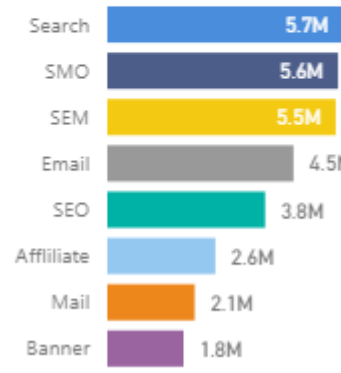
### LAB 4 - EXERCISE 1

Duplicate the report page	<p>1-click on the L4 Exercise 1 page</p> <p>2-right click over the page title and select Duplicate page</p> <p>3-rename the duplicated page to Sales and Profit Report</p>	
Apply the principles that you have learned throughout this course to organize the page and apply the cognitive recognition principals that you have learned.	Below are suggestions	<i>If you need ideas, go to the DataVisualizationLab-Solutions.pbix file and look at the L4 Exercise 1 Solution page.</i>
	4-page layout is important. The most important information should be placed in the top left corner.	4-in this example the most important data is the total sales amount and total gross profit

	<p>5-color is important. Having the title so large and in red distracts from the important information in the report.</p>	<p>5-change the color and size of the report title. Also, the report has mixed types of data. Remove the word geography from the title. modify the Sales and Gross Profit by State and Price Band to remove state and replace the</p>																																																									
	<p>6-modify the Sales and Gross Profit by State and Price Band to remove the state and replace the Shared axis with Year and Month from the DateDim table. Clean up the formatting as you like. Here's an example. Don't forget to clean up the title.</p>	 <p>Sales and Gross Profit by Month</p>  <table border="1"> <caption>Sales and Gross Profit by Month Data (Estimated)</caption> <thead> <tr> <th>Month</th> <th>Sales (\$M)</th> <th>Gross Profit (\$M)</th> </tr> </thead> <tbody> <tr><td>Jan-20</td><td>0.6</td><td>0.2</td></tr> <tr><td>Feb-20</td><td>0.8</td><td>0.3</td></tr> <tr><td>Mar-20</td><td>1.4</td><td>0.4</td></tr> <tr><td>Apr-20</td><td>1.5</td><td>0.4</td></tr> <tr><td>May-20</td><td>1.6</td><td>0.4</td></tr> <tr><td>Jun-20</td><td>1.6</td><td>0.4</td></tr> <tr><td>Jul-20</td><td>1.4</td><td>0.3</td></tr> <tr><td>Aug-20</td><td>1.1</td><td>0.3</td></tr> <tr><td>Sep-20</td><td>1.2</td><td>0.3</td></tr> <tr><td>Oct-20</td><td>0.8</td><td>0.2</td></tr> <tr><td>Nov-20</td><td>0.7</td><td>0.2</td></tr> <tr><td>Dec-20</td><td>0.5</td><td>0.1</td></tr> <tr><td>Jan-21</td><td>0.4</td><td>0.1</td></tr> <tr><td>Feb-21</td><td>0.5</td><td>0.1</td></tr> <tr><td>Mar-21</td><td>0.6</td><td>0.2</td></tr> <tr><td>Apr-21</td><td>1.2</td><td>0.3</td></tr> <tr><td>May-21</td><td>1.3</td><td>0.3</td></tr> <tr><td>Jun-21</td><td>1.1</td><td>0.3</td></tr> </tbody> </table>	Month	Sales (\$M)	Gross Profit (\$M)	Jan-20	0.6	0.2	Feb-20	0.8	0.3	Mar-20	1.4	0.4	Apr-20	1.5	0.4	May-20	1.6	0.4	Jun-20	1.6	0.4	Jul-20	1.4	0.3	Aug-20	1.1	0.3	Sep-20	1.2	0.3	Oct-20	0.8	0.2	Nov-20	0.7	0.2	Dec-20	0.5	0.1	Jan-21	0.4	0.1	Feb-21	0.5	0.1	Mar-21	0.6	0.2	Apr-21	1.2	0.3	May-21	1.3	0.3	Jun-21	1.1	0.3
Month	Sales (\$M)	Gross Profit (\$M)																																																									
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May-21	1.3	0.3																																																									
Jun-21	1.1	0.3																																																									
	<p>7-move the VanArsdel logo to the top right corner and resize as you desire.</p>																																																										

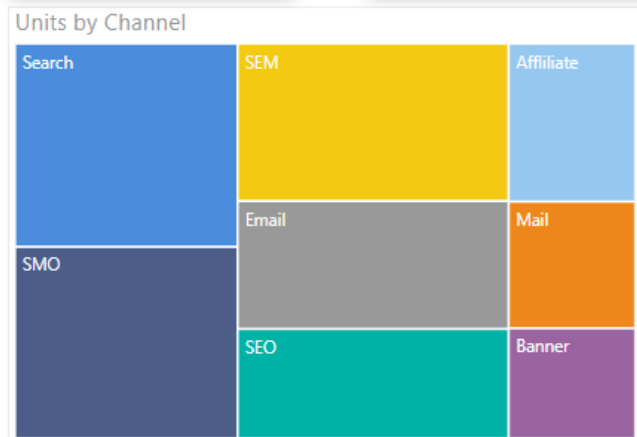
	<p>8-move the Region and Price Brand slicers to the right side of the page. Consider change them from a list to a drop down to reduce the slicer footprint. This is done using the ellipses (3 dots) above the slicer.</p>	
	<p>9-move Total Sales Amount and Total Gross Profit cards to the top left corner of the report. These are the most important measures on the page. Take some time to clean up the title font sizes and number of decimal places on each card. Here's an example. Make sure the card size is consistent and the cards are aligned.</p>	<div><div><p>Total Sales</p><p><b>\$43.6M</b></p></div><div><p>Gross Profit</p><p><b>\$11.8M</b></p></div></div> <p>9- Extra credit if you can add a light border and shading to the cards.</p>
	<p>10-convert the Sales by TrafficChannel pie chart visual to a stacked bar chart. Here's an example.</p> <p>Move this updated visual underneath the Total Sales card and resize and align.</p>	 <p>10. Extra credit for formatting like the example.</p>

	<p>11- copy the Sales by Channel stacked bar chart that you just created and replace the Category in the Axis field with TrafficChannel. Position the new visual underneath the Gross Profit card and format and align as needed. Also update the title to match this example. If necessary, add another decimal place to the data labels. This will differentiate the value of some of the bars.</p> <p>See example</p>	<div><div>Gross Profit</div><div>\$11.8M</div></div> <div><div>Gross Profit by Channel</div><table><tr><td>Search</td><td>\$2.1M</td></tr><tr><td>SMO</td><td>\$2.1M</td></tr><tr><td>SEM</td><td>\$2.0M</td></tr><tr><td>Email</td><td>\$1.7M</td></tr><tr><td>SEO</td><td>\$1.4M</td></tr><tr><td>Affiliate</td><td>\$1.0M</td></tr><tr><td>Mail</td><td>\$0.8M</td></tr><tr><td>Banner</td><td>\$0.7M</td></tr></table></div>	Search	\$2.1M	SMO	\$2.1M	SEM	\$2.0M	Email	\$1.7M	SEO	\$1.4M	Affiliate	\$1.0M	Mail	\$0.8M	Banner	\$0.7M
Search	\$2.1M																	
SMO	\$2.1M																	
SEM	\$2.0M																	
Email	\$1.7M																	
SEO	\$1.4M																	
Affiliate	\$1.0M																	
Mail	\$0.8M																	
Banner	\$0.7M																	
	<p>12- update the Total Units Sold card to match the other cards. Also, change the Data label Display units from None to Auto. This will reduce the number of digits. Don't forget to also reduce the Text Size from 40 pt to match the other cards. Clean up the Title text content and adjust the size and color to be consistent.</p> <p>Do the same thing for the Total COGS card.</p>	<div><div>Units Sold</div><div>446.3K</div></div> <div><div>Total COGS</div><div>31.8M</div></div>																

	<p>13- convert the Total Units Sold by TrafficChannel to a Stacked bar chart and format as the example.</p> <p>Place underneath the Units Sold card and size and align to the other visuals.</p>	<div><div>Units Sold</div><div>446.3K</div></div> <div><div>Units by Channel</div><table><tr><th>Channel</th><th>Units</th></tr><tr><td>Search</td><td>82K</td></tr><tr><td>SMO</td><td>78K</td></tr><tr><td>SEM</td><td>78K</td></tr><tr><td>Email</td><td>63K</td></tr><tr><td>SEO</td><td>54K</td></tr><tr><td>Affiliate</td><td>36K</td></tr><tr><td>Mail</td><td>29K</td></tr><tr><td>Banner</td><td>25K</td></tr></table></div>	Channel	Units	Search	82K	SMO	78K	SEM	78K	Email	63K	SEO	54K	Affiliate	36K	Mail	29K	Banner	25K
Channel	Units																			
Search	82K																			
SMO	78K																			
SEM	78K																			
Email	63K																			
SEO	54K																			
Affiliate	36K																			
Mail	29K																			
Banner	25K																			
	<p>14 - copy the Units by Channel stacked bar chart that you just created and replace the Units in the Values field with COGS from the Sales table. Position the new visual underneath the Total COGS card and format and align as needed. Also update the title to match this example.</p>	<div><div>Total COGS</div><div>31.8M</div></div> <div><div>COGS by Channel</div><table><tr><th>Channel</th><th>COGS</th></tr><tr><td>Search</td><td>5.7M</td></tr><tr><td>SMO</td><td>5.6M</td></tr><tr><td>SEM</td><td>5.5M</td></tr><tr><td>Email</td><td>4.5M</td></tr><tr><td>SEO</td><td>3.8M</td></tr><tr><td>Affiliate</td><td>2.6M</td></tr><tr><td>Mail</td><td>2.1M</td></tr><tr><td>Banner</td><td>1.8M</td></tr></table></div>	Channel	COGS	Search	5.7M	SMO	5.6M	SEM	5.5M	Email	4.5M	SEO	3.8M	Affiliate	2.6M	Mail	2.1M	Banner	1.8M
Channel	COGS																			
Search	5.7M																			
SMO	5.6M																			
SEM	5.5M																			
Email	4.5M																			
SEO	3.8M																			
Affiliate	2.6M																			
Mail	2.1M																			
Banner	1.8M																			

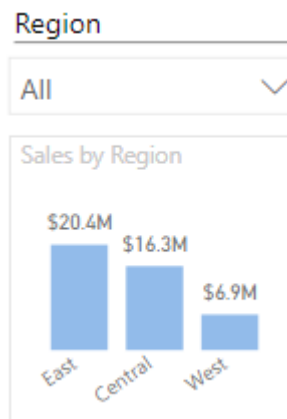
15 – change the Title of the Units by TrafficChannel to Units by Channel and change the font to Segoe UI. Also change the Title Font color to gray (to match the other graphics). Resize the Treemap visual to align with other page visuals.

Change the color of the data elements to match the other visuals on the page by category (use the Data colors drop down in the visualization pane to change the colors).



16 – add a Sales by Region Stacked column visual beneath the Region slicer.

Format as in the example.

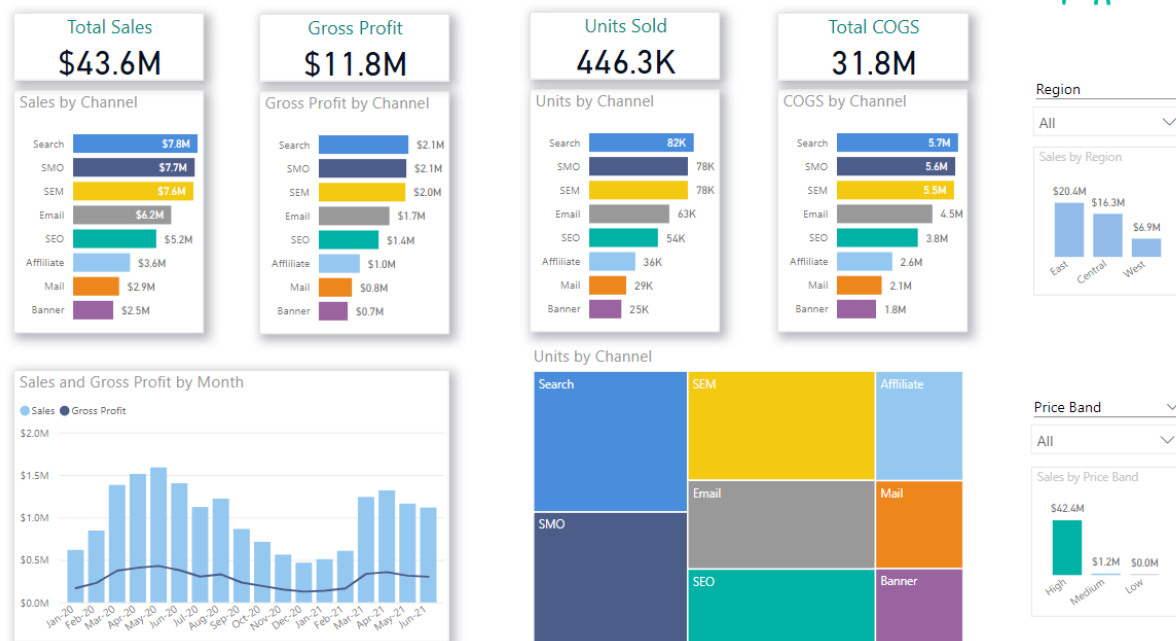




	<p>17 – do the same thing for Price Band. Add a Sales by Price Band Stacked column visual beneath the Sales Band slicer.</p> <p>Format as in the example.</p>	<div> <div>Price Band</div> <div>All</div> <div> <div>Sales by Price Band</div> <div> <div>\$42.4M</div> <div>High</div> <div>\$1.2M</div> <div>Medium</div> <div>\$0.0M</div> <div>Low</div> </div> </div> </div>
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Here's an example of the report format for consistency. The title fonts sizes and colors are consistent. The alignment of visuals is improved. The most important visuals are in the top left and less important items are moved to the right and down. The data is grouped in more meaning ways and unrelated data has been removed (hopefully to other pages).

## Sales and Profit Report



# Other Classes Taught by JourneyTEAM

## Power BI

- Fundamentals of DAX
- Intermediate DAX
- Advanced DAX
- Dashboard in a Day
- Advanced Dashboard in a Day
- Admin in a Day
- Advanced Visualizations

## Power Automate

- Flow in a Day
- Advanced Flow in a Day

## Power Apps

- Power Apps in a Day
- Advanced Power Apps in a Day

## Power Virtual Agent

- Virtual Agent in a Day



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