LEVEL OF DETAILS EXPRESSIONS (LODs)

Level of Detail expressions (also known as **LOD expressions**) allows us to compute values at the **data source level** and the **visualization level**

However, **LOD expressions** give us even more **control on the level of granularity** that we may want to compute

They can be performed at a **more granular level (INCLUDE)**, a **less granular level (EXCLUDE)**, or an **entirely independent level (FIXED)**

TYPES OF LOD EXPRESSIONS (LODs)

There are three types of LOD expressions that we can create in Tableau:

FIXED (entirely independent level)
INCLUDE (more granular level)
EXCLUDE (less granular level)

We can also scope an LOD expression to the table
This is called a **Table-Scoped LOD expression**

LOD EXPRESSION SYNTAX

A level of detail expression has the following structure

{[FIXED | INCLUDE | EXCLUDE] <dimension declaration > : <aggregate expression>}

The elements in a level of detail expression are described below

Element	Description
{ }	The entire level of detail expression is enclosed in curly braces
[**FIXED	INCLUDE	EXCLUDE**]	The first element after the opening curly brace is one of the following scoping keywords FIXED, INCLUDE or EXCLUDE
<dimension declaration>	Specifies one or more dimensions to which the aggregate expression is to be joined. Use commas to separate dimensions
:	A colon separates the dimension declaration from the aggregate expression
<aggregate expression>	The aggregate expression is the calculation performed to define the target dimensionality

TABLE-SCOPED LOD

It is possible to define a **level of detail expression** at the **table level without** using any of the **scoping keywords**

For example, the following expression returns the **SUM of Sales** for the **entire table**:

{ SUM([Sales]) }

This calculation will store the sum of sales for the entire dataset and this value cannot be broken down further

TABLE-SCOPED LOD

Assume we have a Viz with **Category** and **Sub-Category** on **Rows** Shelf and **Sales** on **Columns** Shelf

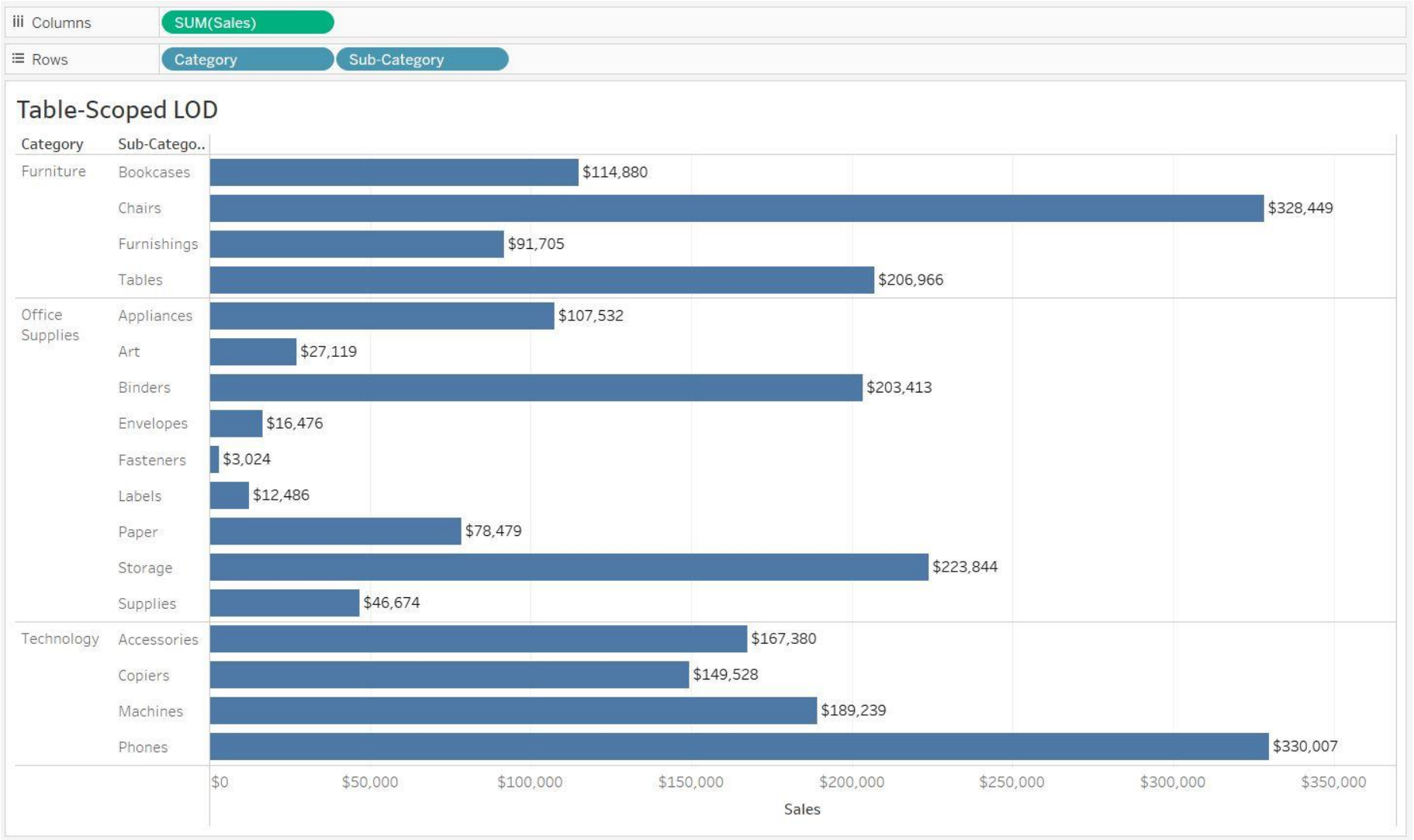


TABLE-SCOPED LOD

Create Calculated Field

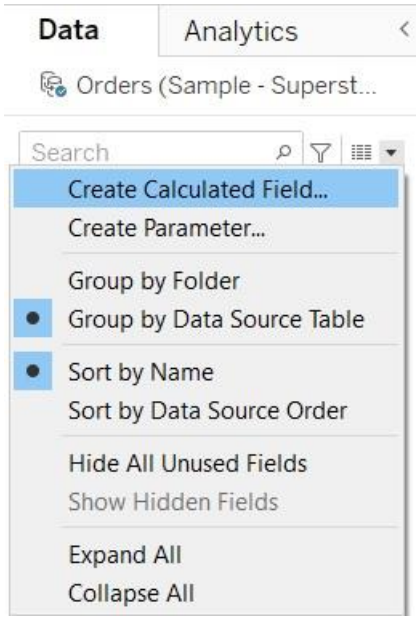


TABLE-SCOPED LOD

Calculation Editor opens up

TABLE-SCOPED LOD

Enter the name and formula as given below

This calculation will store the sum of sales for the entire dataset and this value cannot be broken down further

TABLE-SCOPED LOD

The newly created field will now be present in the **Measures** section of **Data** pane

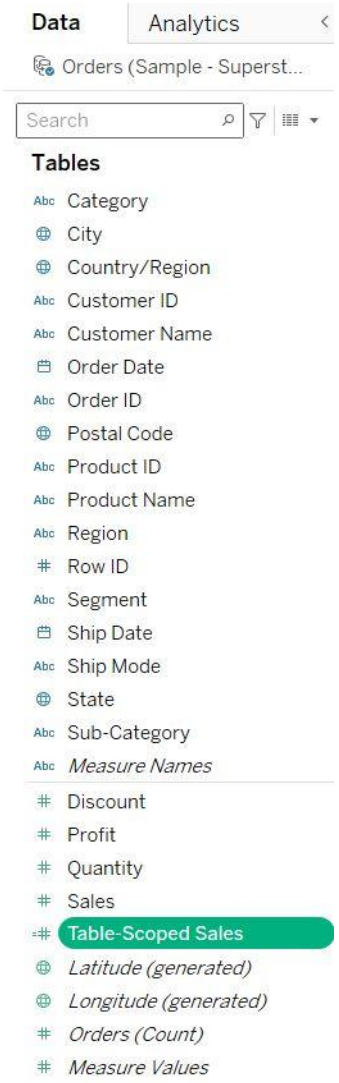
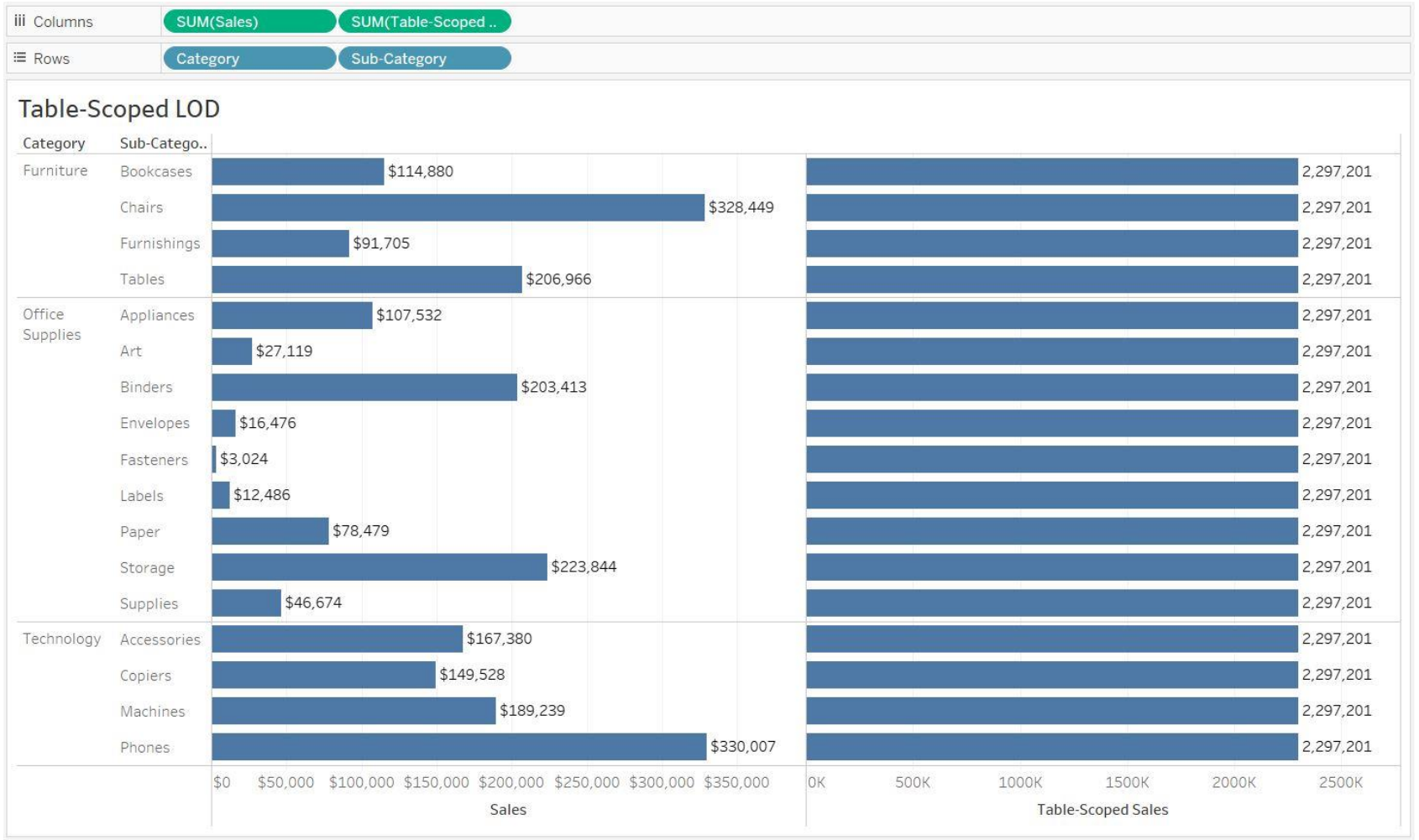


TABLE-SCOPED LOD

Drag the **Table-Scoped Sales** to **Columns shelf**



As observed, this is a constant value for **SUM(Sales)** for the entire dataset without caring about the viz LOD

FIXED LOD

FIXED level of detail expressions compute a value using **the specified dimensions, without reference to the dimensions in the view**

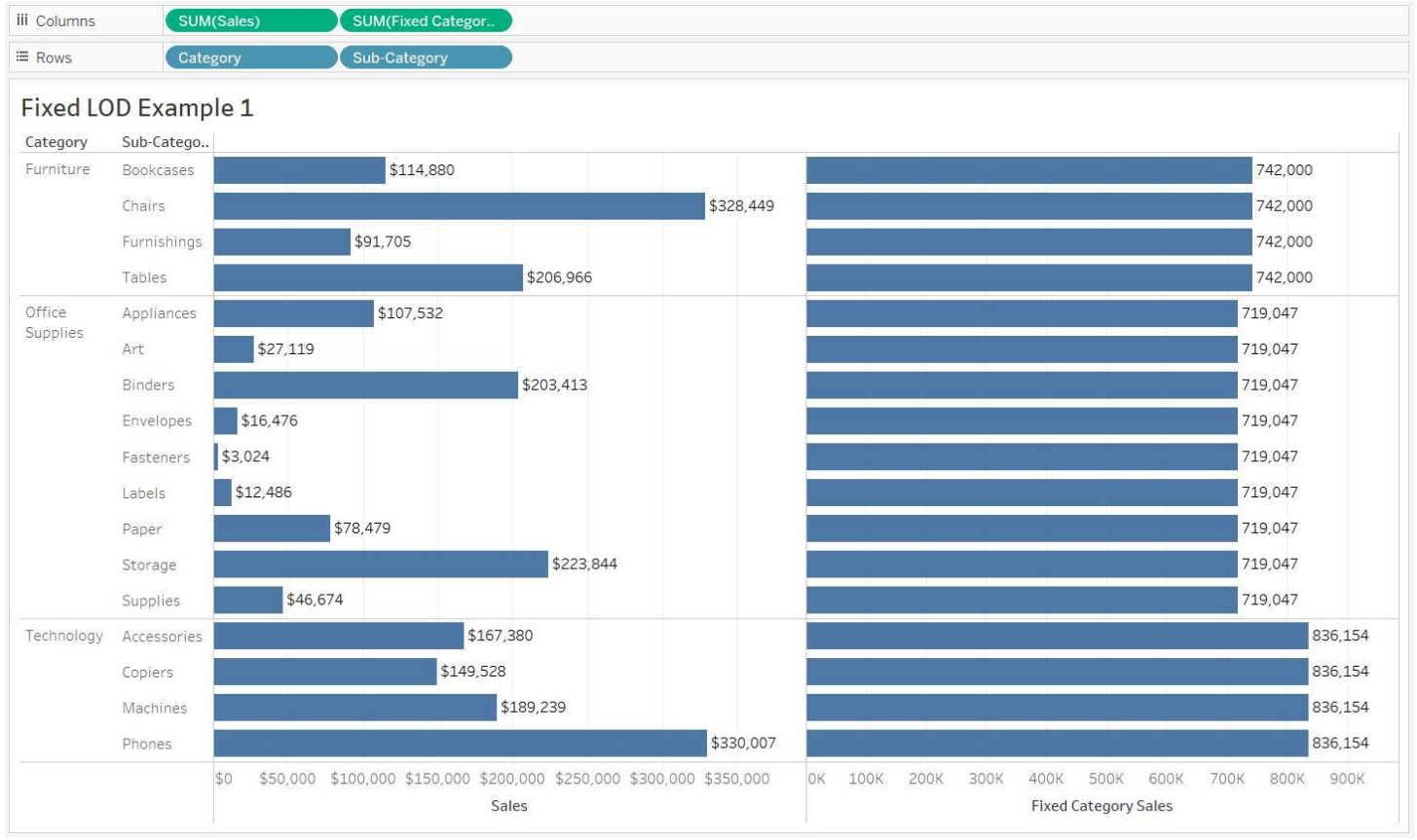
FIXED LOD expressions compute their values without caring about the viz LOD

FIXED LOD

Create the calculated field for Fixed LOD i.e., **Fixed Category Sales**

FIXED LOD

Drag the **Fixed Category Sales** to **Columns shelf**



As observed, this LOD expression provides the **SUM(Sales)** at the **Category level** without caring about the **Sub-Category level**

This can be confirmed by checking the Category Wise Sales

FIXED LOD

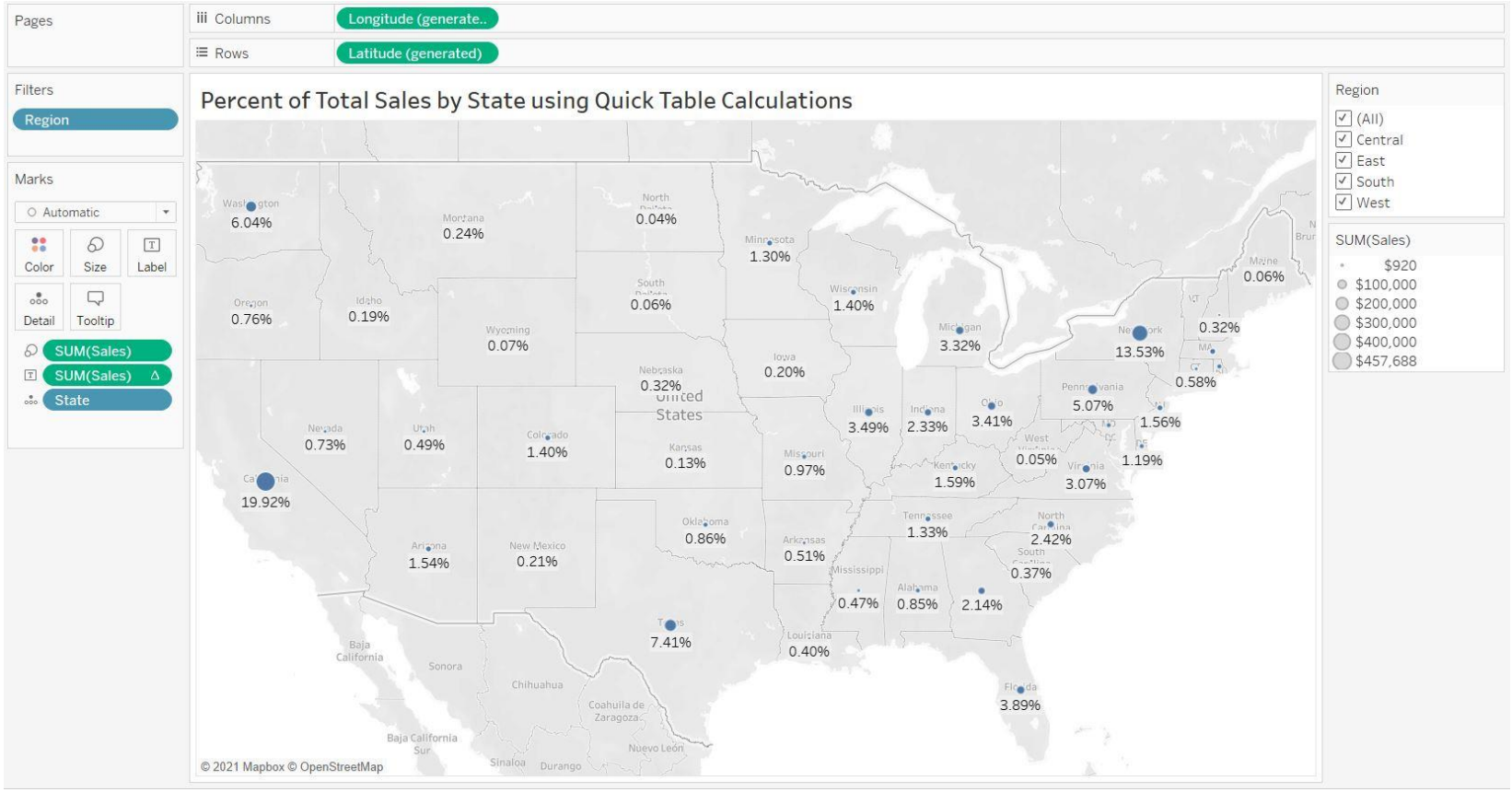
Another use case for **FIXED LOD** is for calculating percent of total

Consider the below Map Viz with the below configuration

Label & Size: SUM(Sales): Quick Table Calculation → Percent of Total

Filters Shelf: Region

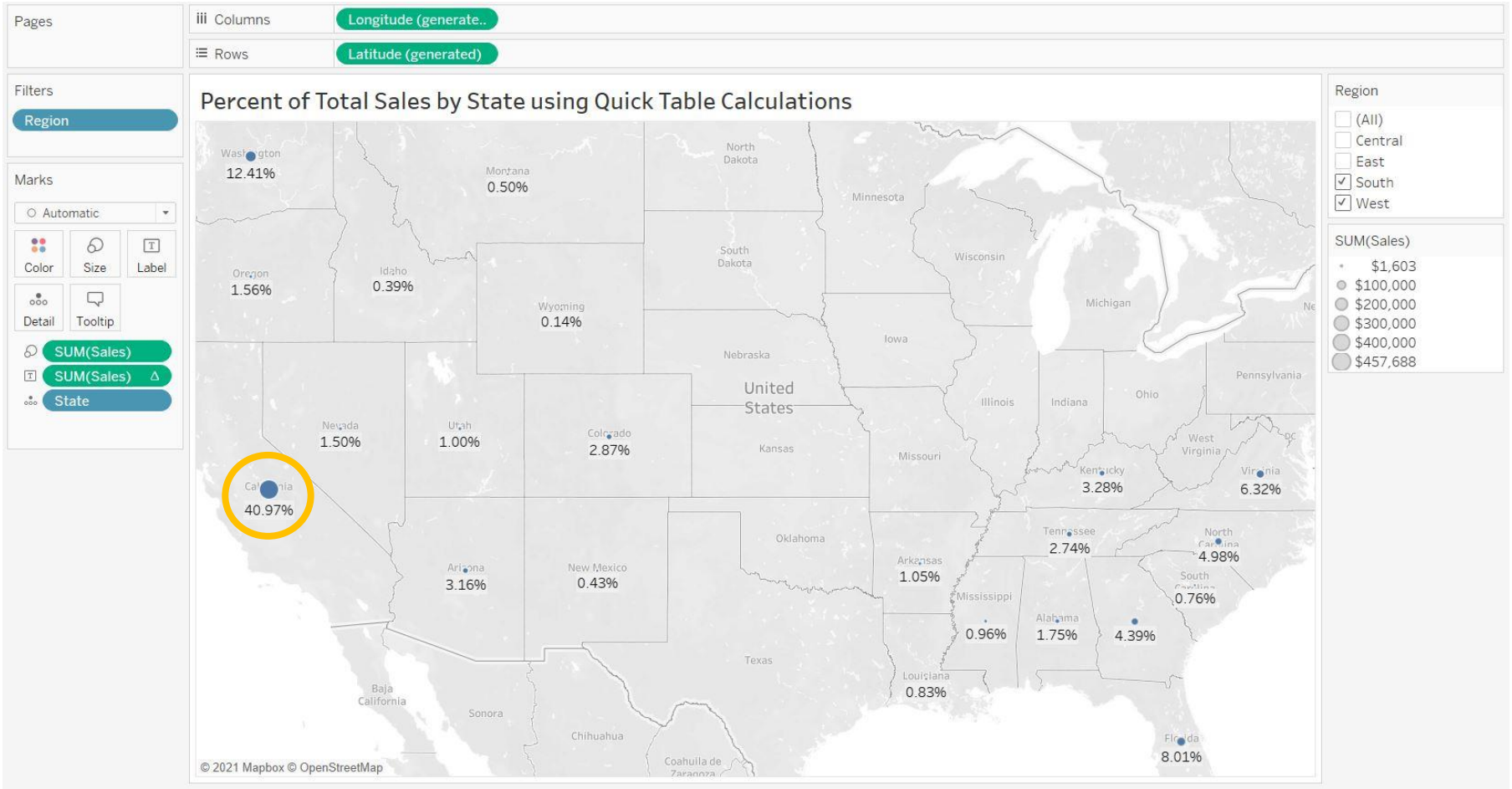
Detail: State



FIXED LOD

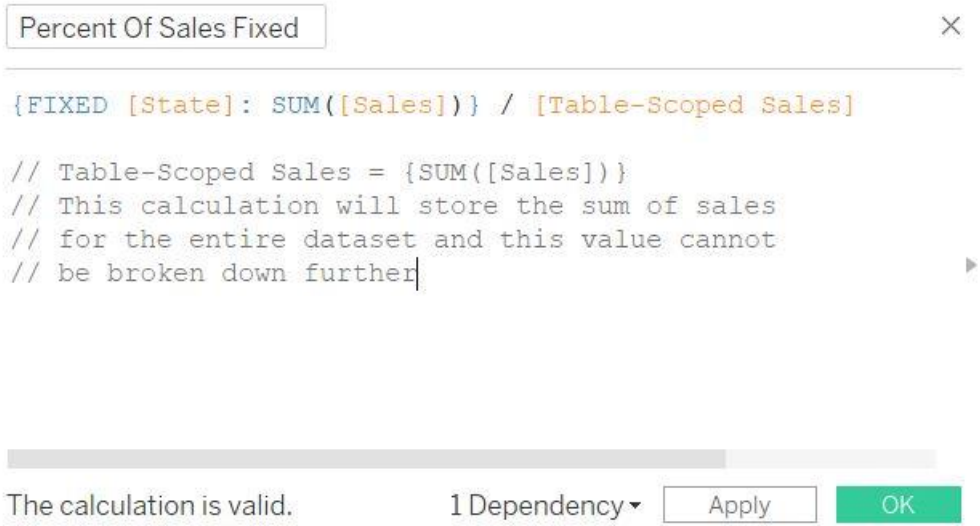
When we change the filter options for Region, we observe that the Sales Percent of Total is changing for all states

Let us focus on **California**. It is 40.97%



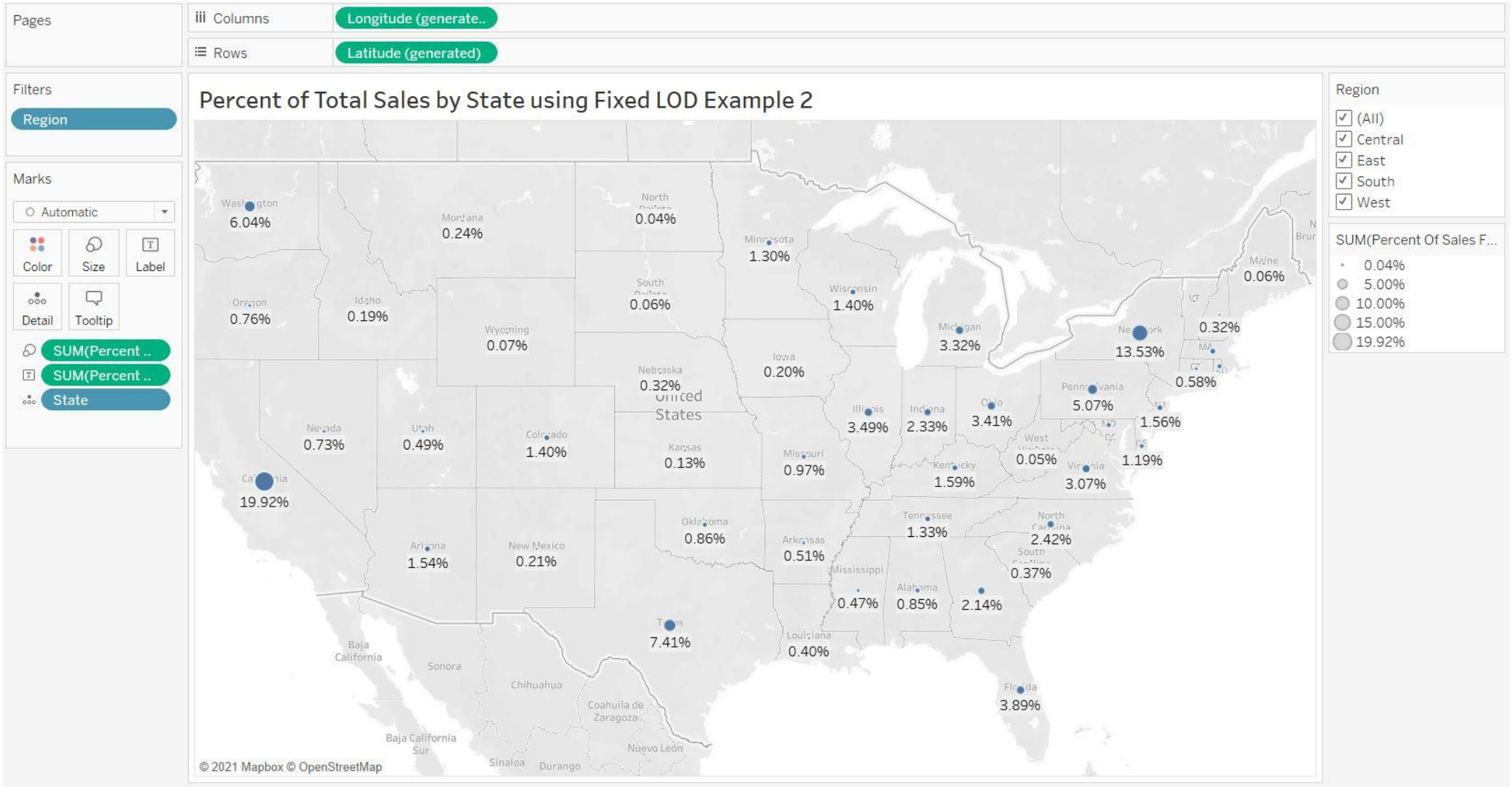
FIXED LOD

Suppose we need to maintain the same Percent of Sales for each state irrespective of Region filter. For this we need to create a Fixed LOD expression as mentioned below



FIXED LOD

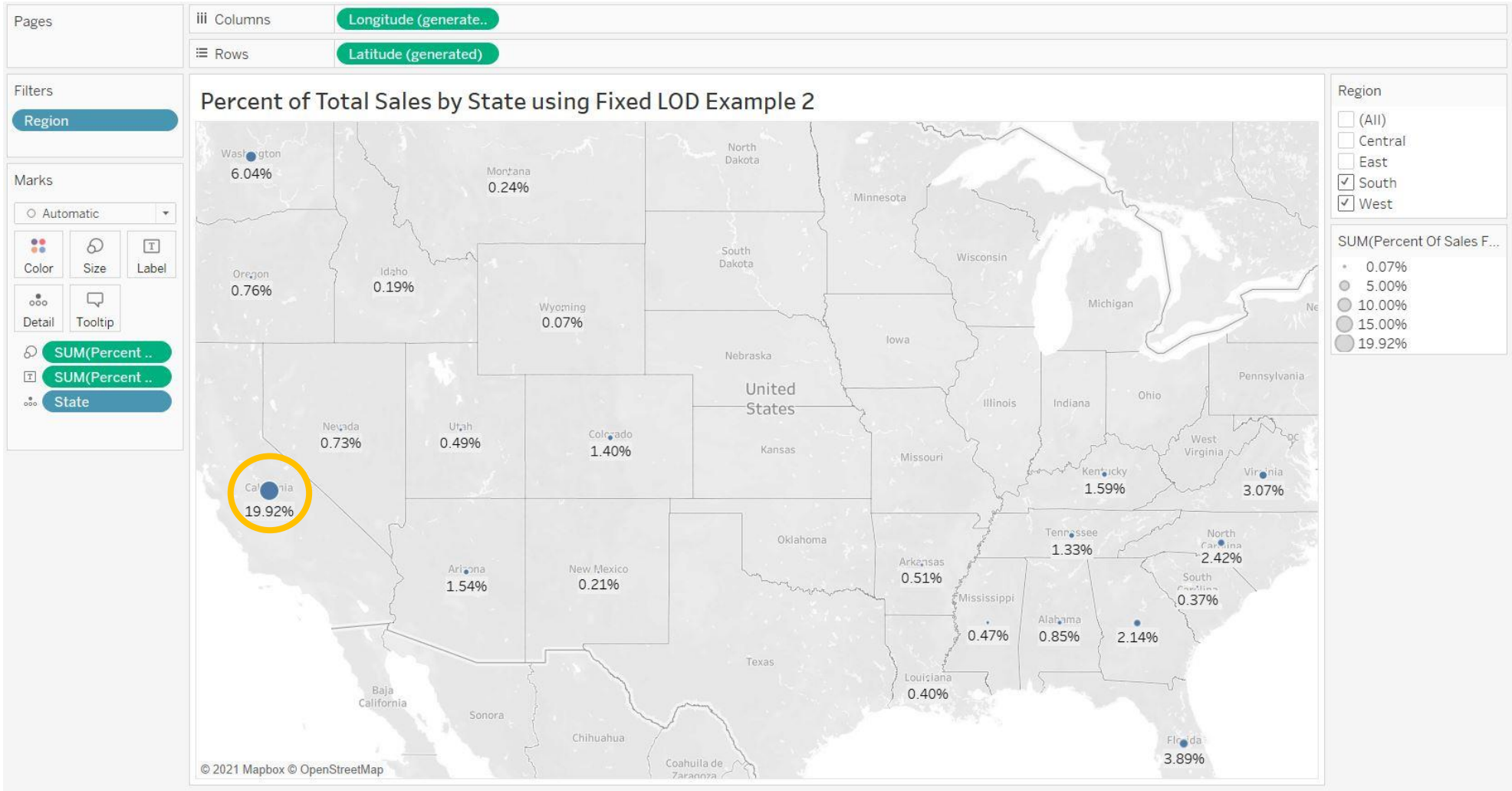
Drag the newly created field **Percent Of Sales Fixed** to the **Size** and **Label of Marks card.** Change the number format to Percentage



FIXED LOD

De-select **Central** and **East** in **Region** Filter

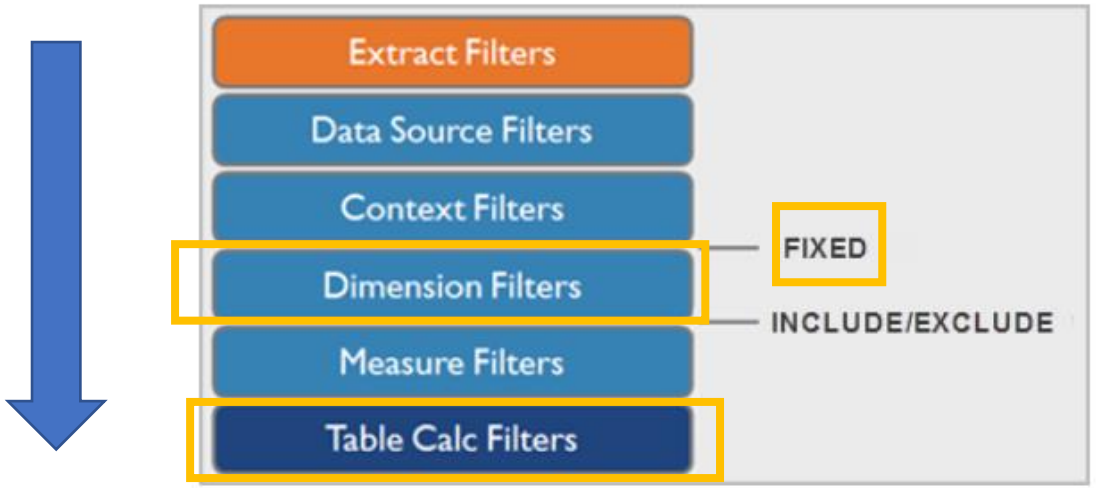
Now we observe that the Percentage Of Sales remains fixed irrespective of the options selected in the Region Filter



FIXED LOD

This was possible only because of **Tableau's Order of Operations**

There are several different kinds of filters in Tableau, and they get executed in the following order from **top to bottom**.



NOTE: FIXED level of detail expressions ignore all the filters in the view other than context filters, data source filters, and extract filters

In our example we will be making use of only FIXED, Dimension Filters and Table Calc Filters

Hence Fixed LOD will be executed first followed by Dimension Filter (Region) and finally the Table Calculation will be executed

INCLUDE LOD

INCLUDE level of detail expressions compute values using the **specified dimensions** in **addition to whatever dimensions are in the view**

INCLUDE level of detail expressions are most useful **when including a dimension that isn't in the view**

INCLUDE level of detail expressions can be useful when we want to calculate at a fine level of detail in the database and then re-aggregate and show at a coarser level of detail in the view

INCLUDE LOD

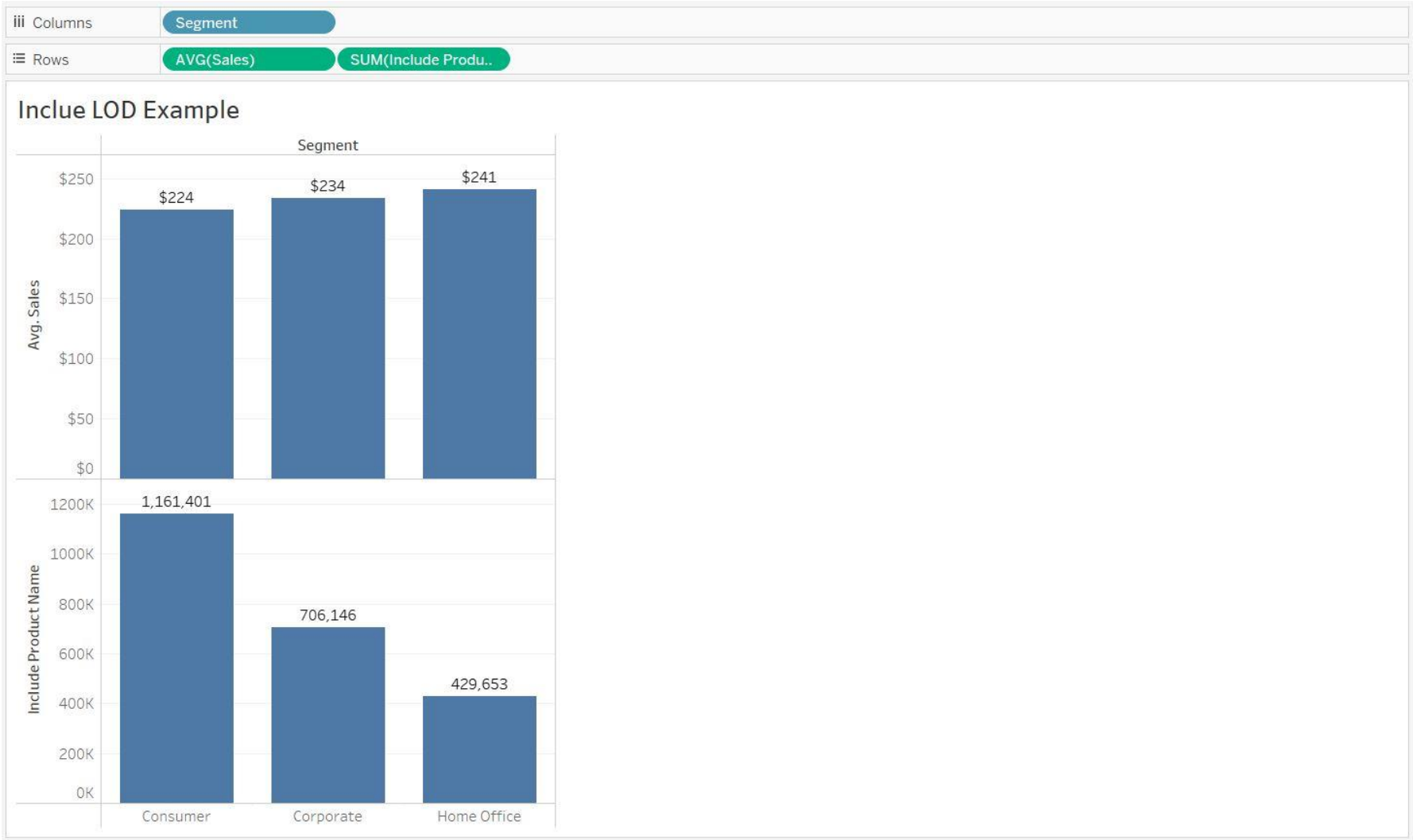
Assume we have a Viz with **Segment** on **Columns** Shelf and **AVG(Sales)** on **Rows** Shelf

INCLUDE LOD

Suppose we need to also include Product Name Sales details in addition to the level of the detail in the view. For this we need to create a Include LOD expression i.e., **Include Product Name** as mentioned below

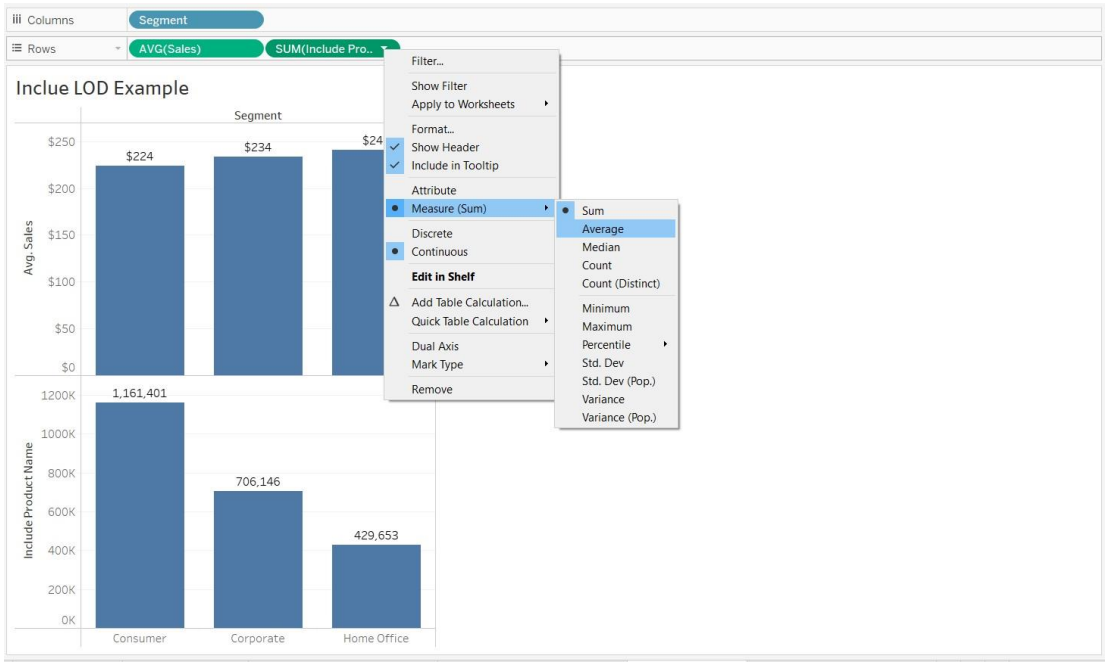
INCLUDE LOD

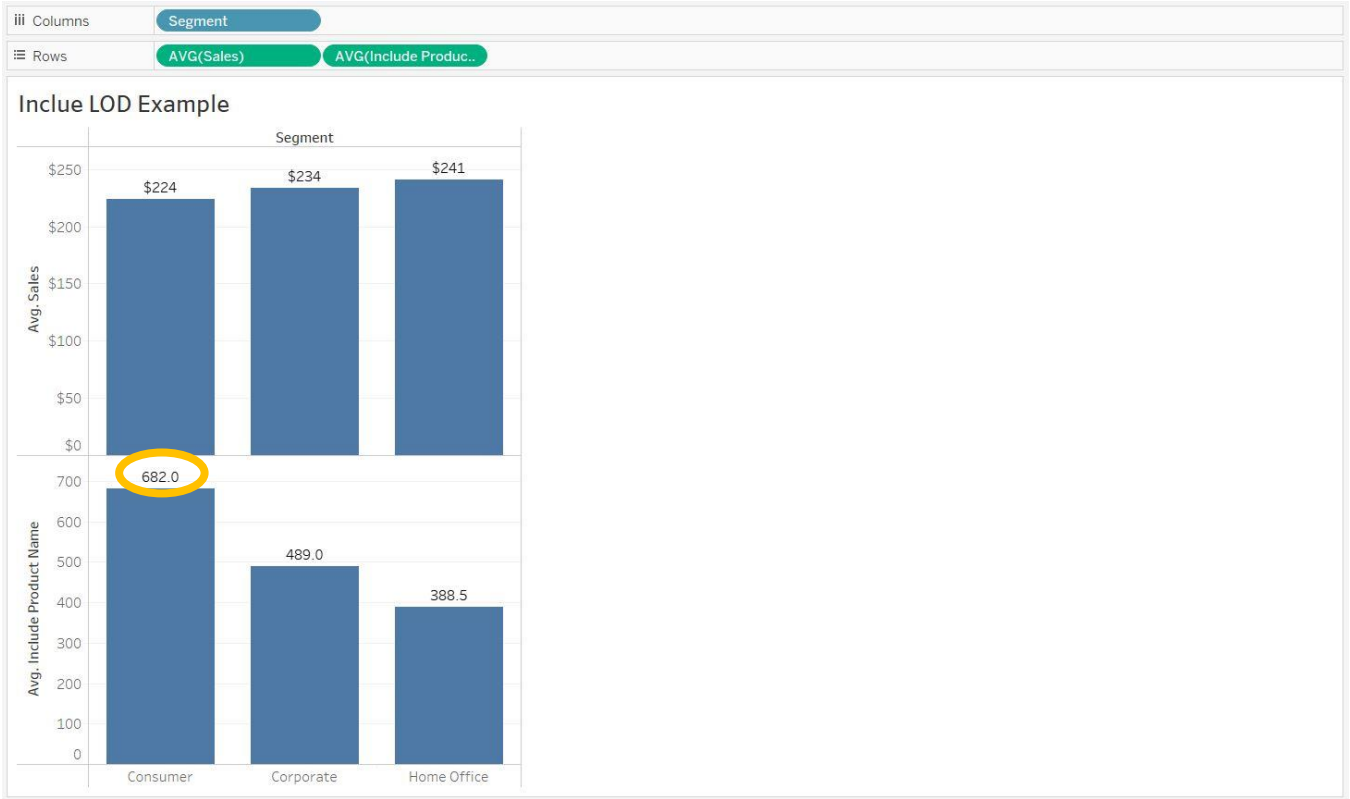
Drag the newly created field **Include Product Name** to the **Rows** shelf



INCLUDE LOD

Change the aggregation to **Average**





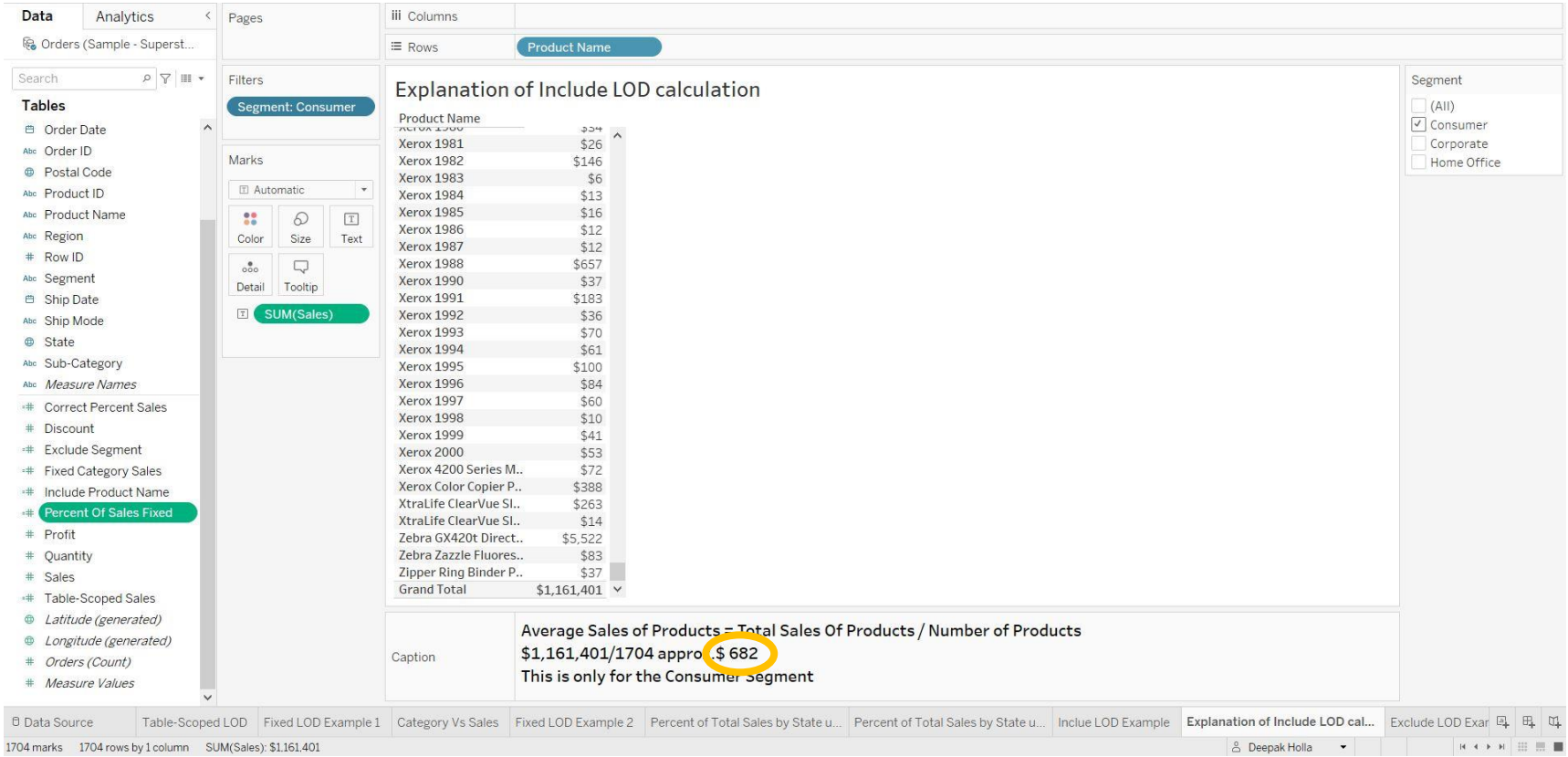
INCLUDE LOD

We can check the Include LOD calculation by using the below viz

Rows Shelf: Product Name

Filters Shelf: Segment > Consumer

Text of Marks card: Sales



Average Sales of Products is calculated as Total Sales of Products/ Number of Products (Marks)

This is calculated only for the Consumer Segment

This value matches the average calculated by using the **Include Product Name**

EXCLUDE LOD

EXCLUDE level of detail expressions declare **dimensions to omit from the view level of detail**

EXCLUDE level of detail expressions **explicitly remove dimensions** from the **expression**—that is, they **subtract dimensions** from **the view level of detail**

EXCLUDE level of detail expressions are most useful for **eliminating a dimension in the view**

EXCLUDE LOD

Assume we have a Viz with the below mentioned configuration

Rows Shelf: MONTH(Order Date) (Date Part)

Columns Shelf: Segment and Sales

Color of Marks card: Sales

EXCLUDE LOD

Suppose we need the Color coding to be done only based on MONTH(Order Date). For this we need to create a Exclude LOD expression i.e., **Exclude Segment** as mentioned below

EXCLUDE LOD

Drag the newly created field **Exclude Segment** to the **Color** of **Marks** card

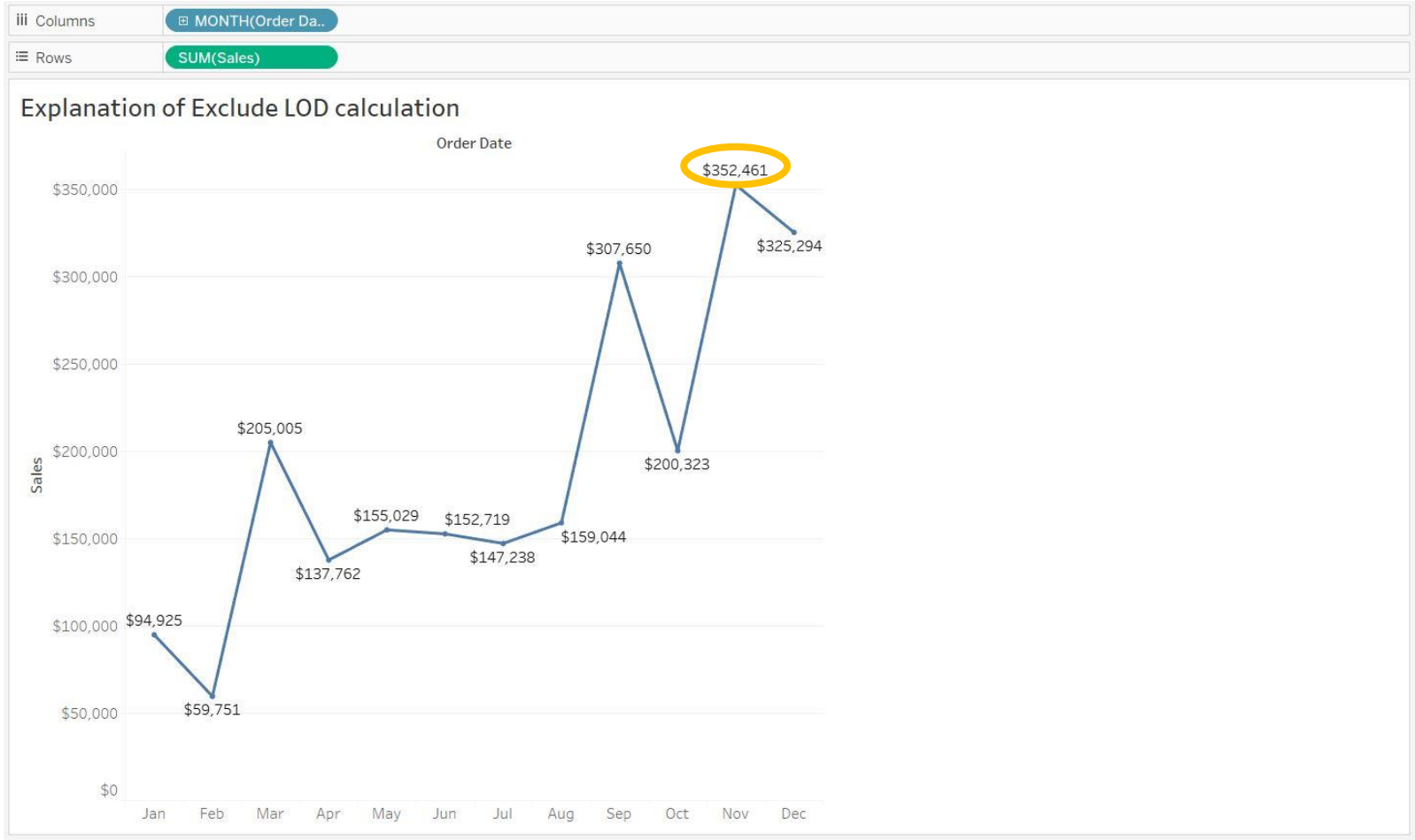
We see that the **color coding has changed although the values have not changed**

EXCLUDE LOD

We can check the Exclude LOD calculation by using the below viz

Rows Shelf: Sales

Columns Shelf: Month(Order Date) (Date Part)



We observe that the **maximum value** is **$352,461** which matches the maximum value in the color legend when **Exclude Segment** was used on **Color** of **Marks** card