

LOD and Behold:

A Guide to LODs in Tableau

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arapaport@salesforce.com

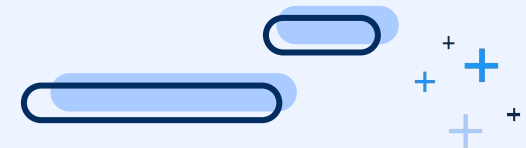
Nick Bradford, Senior Solution Engineer
nbradford@salesforce.com



Forward Looking Statements

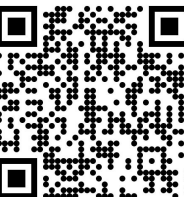
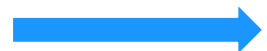


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Scan the QR code to connect with Nick and Andy as well as links to our favorite resources!

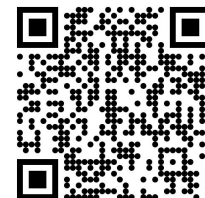
Look for the QR code in the rest of the presentation

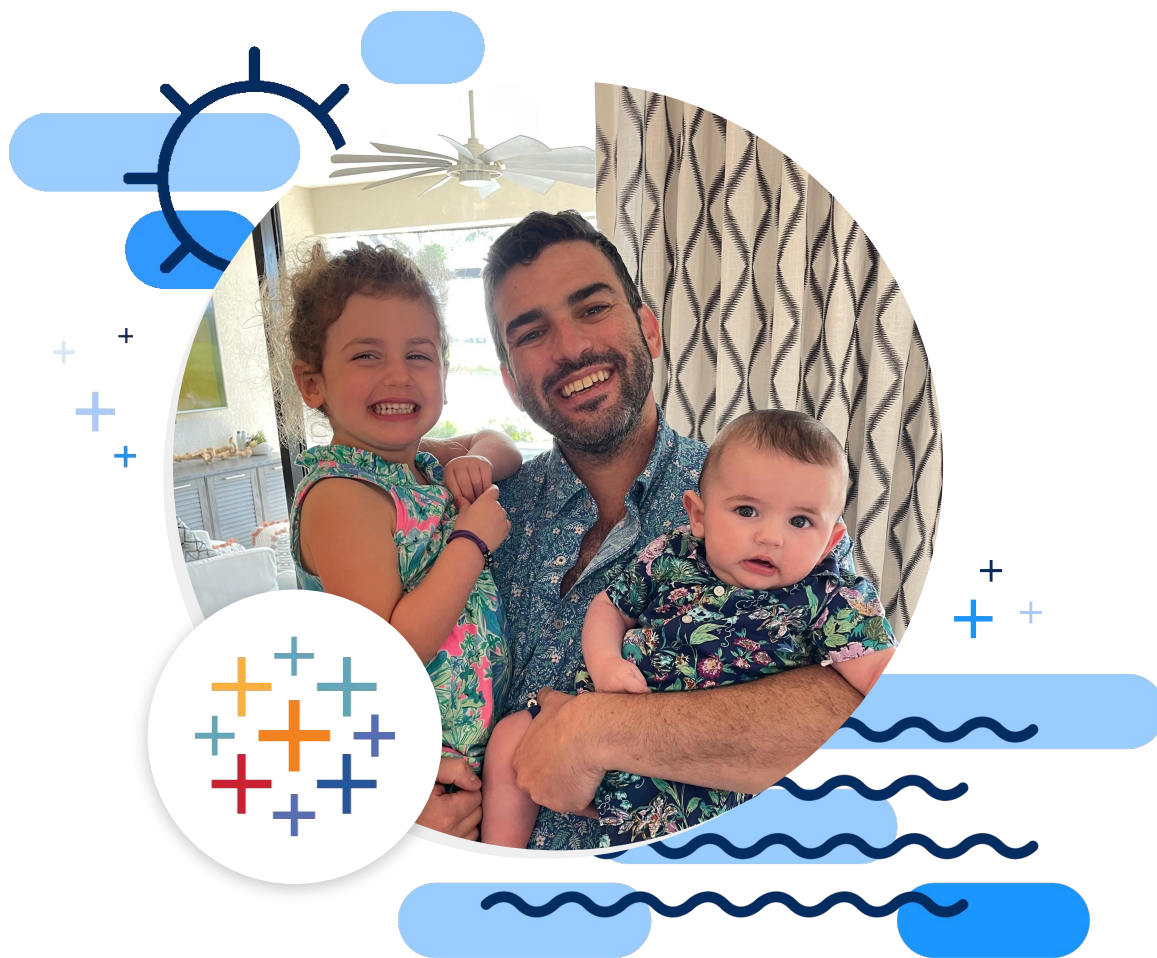


Nick Bradford

Senior Solution Engineer

- Live in Orlando Florida
- Scuba diver
- Joined Tableau in May 2022

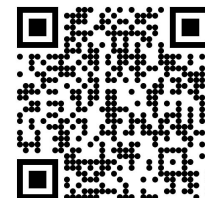




Andy Rapaport

Lead Solution Engineer

- Live in Pittsburgh with wife and two kids
- Spent 10 years working in strategy and analytics for a major bank
- Plays lot of tennis
- Joined Tableau in April 2021



Calculation Types in Tableau

Basic Expressions

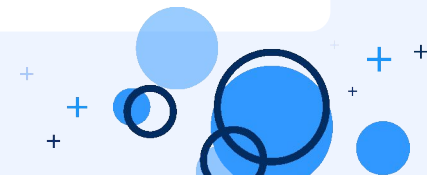
Basic expressions allow you to transform values or members at the data source level of detail (a **row-level calculation**) or at the visualization level of detail (an **aggregate calculation**).

Table Calculations

Table calculations allow you to transform values at the level of detail of the visualization only

Level of Detail Expressions

Just like basic expressions, LOD expressions allow you to compute values at the data source level and the visualization level. However, LOD expressions give you even more control on the level of granularity you want to compute



Calculation Types in Tableau

Basic Expressions

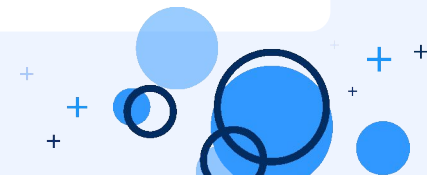
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Level of Detail Expressions

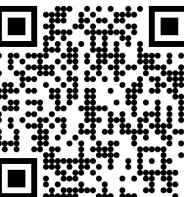
Just like basic expressions, LOD expressions allow you to compute values at the data source level and the visualization level. However, LOD expressions give you even more control on the level of granularity you want to compute



Consider this...

SUM of [SALES] by SEGMENT

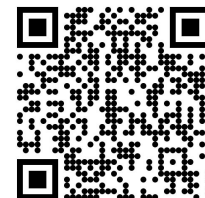
Segment	Sales 1	Sales 2
Consumer	\$1,170,660	\$1,170,660
Corporate	\$715,806	\$715,806
Home Office	\$440,068	\$440,068



Look again...

SUM of [SALES] by SEGMENT and CATEGORY

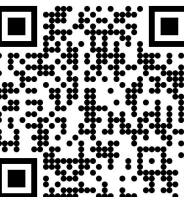
Segment	Category	Sales 1	Sales 2
Consumer	Furniture	\$394,724	\$1,170,660
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BEHOLD!!!



{ FIXED (Segment): SUM((Sales)) }

The Level of Detail Expression



Agenda



01

Granularity

Data Granularity and Viz Granularity

02

Structure of the LOD

Calculation Syntax

03

FIXED LOD

Challenge #1

04

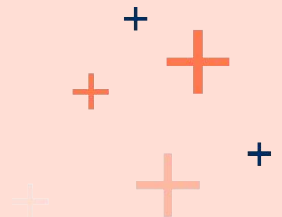
INCLUDE LOD

Challenge #2

05

EXCLUDE LOD

Challenge #3

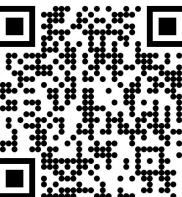


Granularity

Level of Detail of the Data

or Granularity of the Data

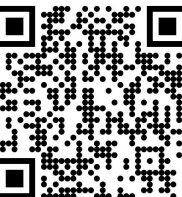
Row ID	Order ID	Order Date	Ship Date	Product ID	Category	Sub-Category	Product Name	Sales
1	US-2020-103800	01/03/2020	01/07/2020	OFF-PA-10000174	Office Supplies	Paper	Message Book, Wirebound, Four 5 1/2" X 4" Forms/Pg.	16.448
2	US-2020-112326	01/04/2020	01/08/2020	OFF-BI-10004094	Office Supplies	Binders	GBC Standard Plastic Binding Systems Combs	3.54
3	US-2020-112326	01/04/2020	01/08/2020	OFF-LA-10003223	Office Supplies	Labels	Avery 508	11.784
4	US-2020-112326	01/04/2020	01/08/2020	OFF-ST-10002743	Office Supplies	Storage	SAFCO Boltless Steel Shelving	272.736
5	US-2020-141817	01/05/2020	01/12/2020	OFF-AR-10003478	Office Supplies	Art	Avery Hi-Liter EverBold Pen Style Fluorescent Highlighter	19.536
6	US-2020-167199	01/06/2020	01/10/2020	FUR-CH-10004063	Furniture	Chairs	Global Deluxe High-Back Manager's Chair	2,573.82
7	US-2020-167199	01/06/2020	01/10/2020	OFF-AR-10001662	Office Supplies	Art	Rogers Handheld Barrel Pencil Sharpener	5.48
8	US-2020-106054	01/06/2020	01/07/2020	OFF-AR-10002399	Office Supplies	Art	Dixon Prang Watercolor Pencils, 10-Color Set with Brushes	12.78
9	US-2020-167199	01/06/2020	01/10/2020	OFF-BI-10004632	Office Supplies	Binders	Ibico Hi-Tech Manual Binding System	609.98
10	US-2020-167199	01/06/2020	01/10/2020	OFF-FA-10001883	Office Supplies	Fasteners	Alliance Super-Size Bands, Assorted Sizes	31.12
11	US-2020-167199	01/06/2020	01/10/2020	OFF-PA-10000955	Office Supplies	Paper	Southworth 25% Cotton Granite Paper & Envelopes	6.54
12	US-2020-130813	01/06/2020	01/08/2020	OFF-PA-10002005	Office Supplies	Paper	Xerox 225	19.44



Level of Detail of the Data

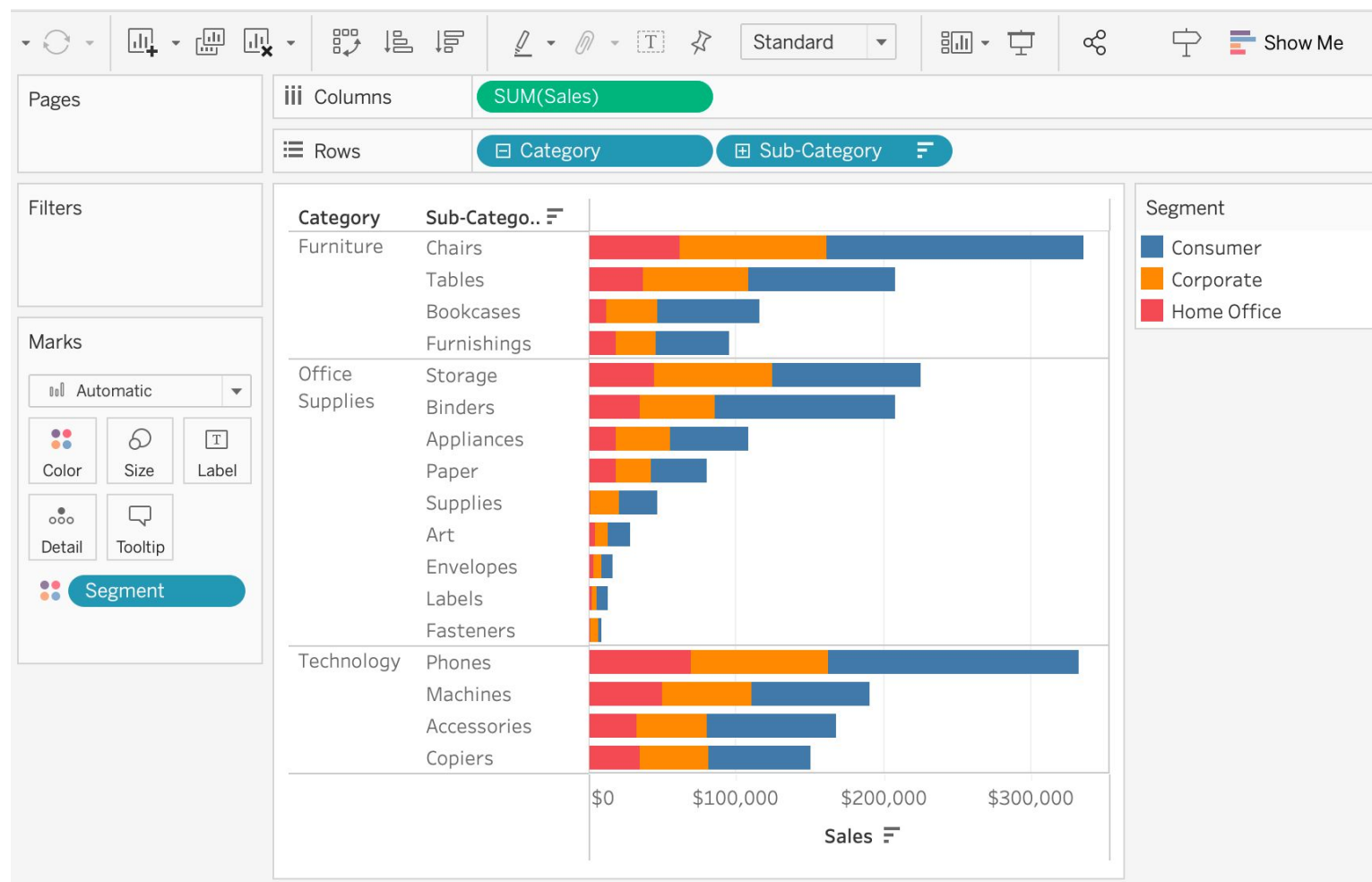
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Level of Detail of the Viz

or Granularity of the Viz



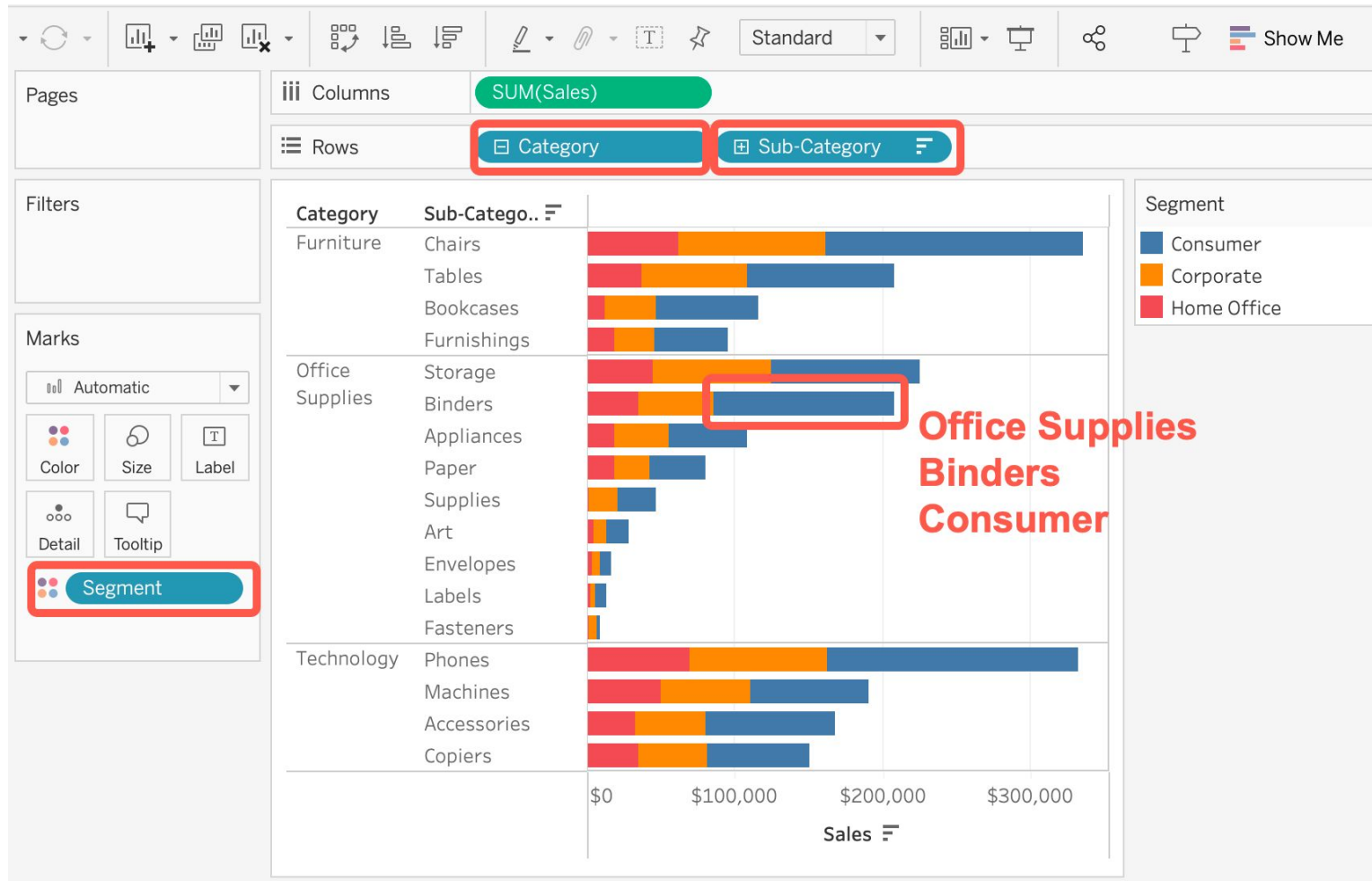
What is the granularity of this viz?

Sales by:



Level of Detail of the Viz

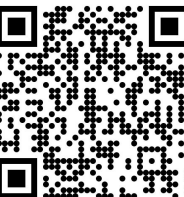
or Granularity of the Viz



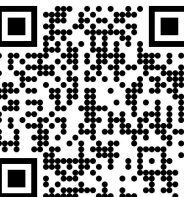
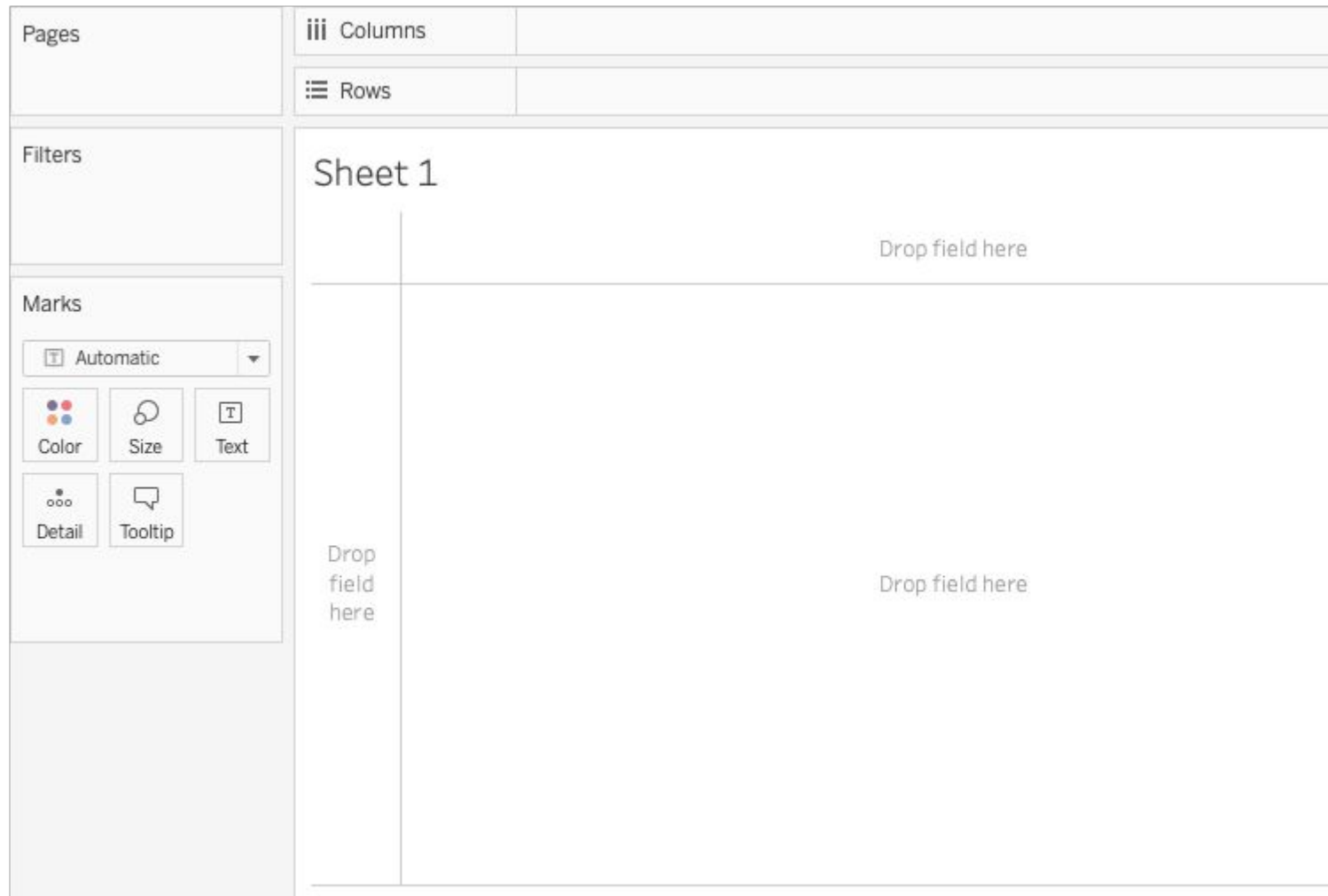
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Sales by:

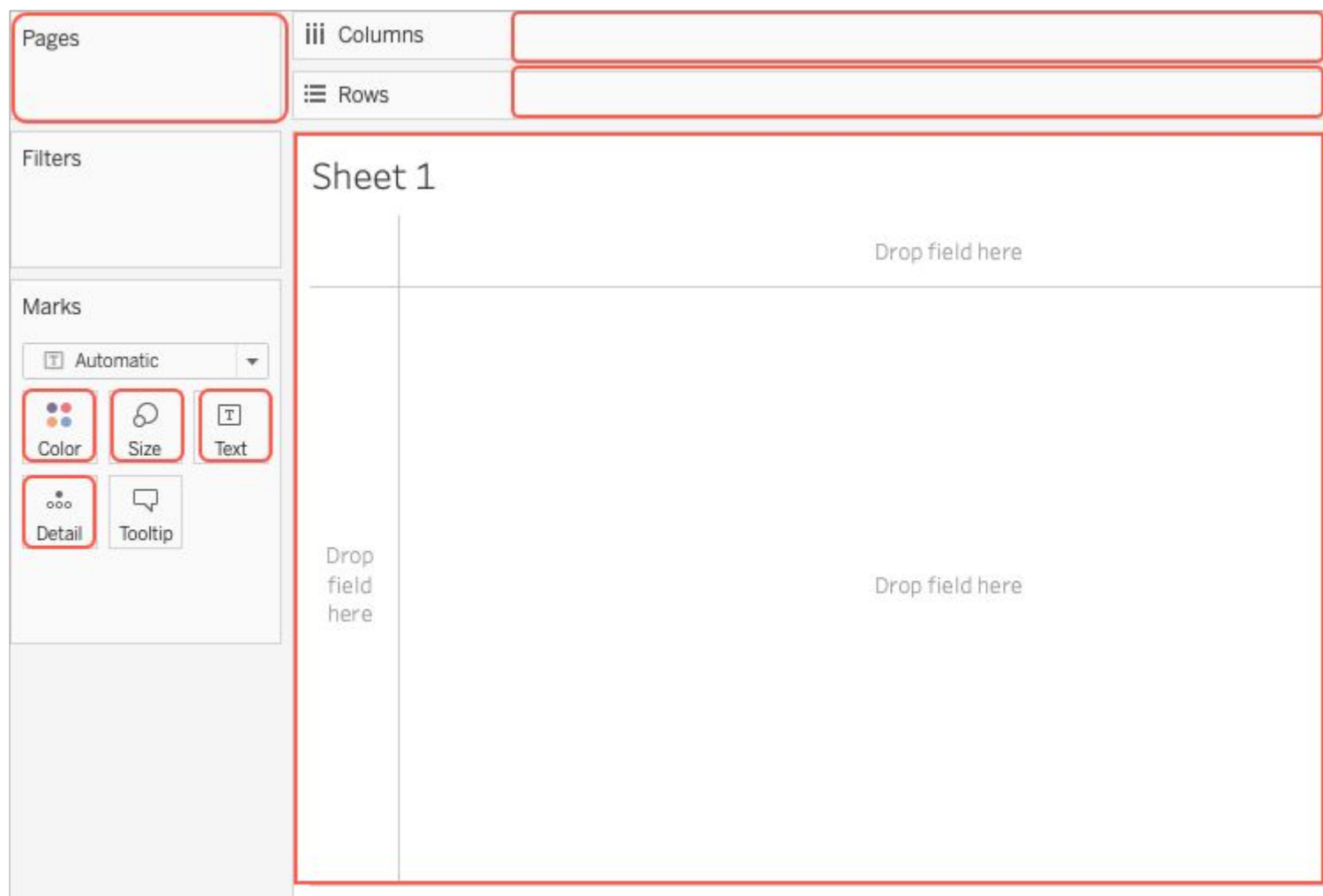
- Category
- Sub-Category
- Segment



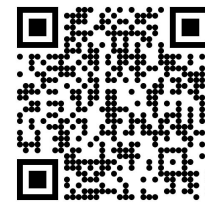
Shelves that Define the Viz LOD:



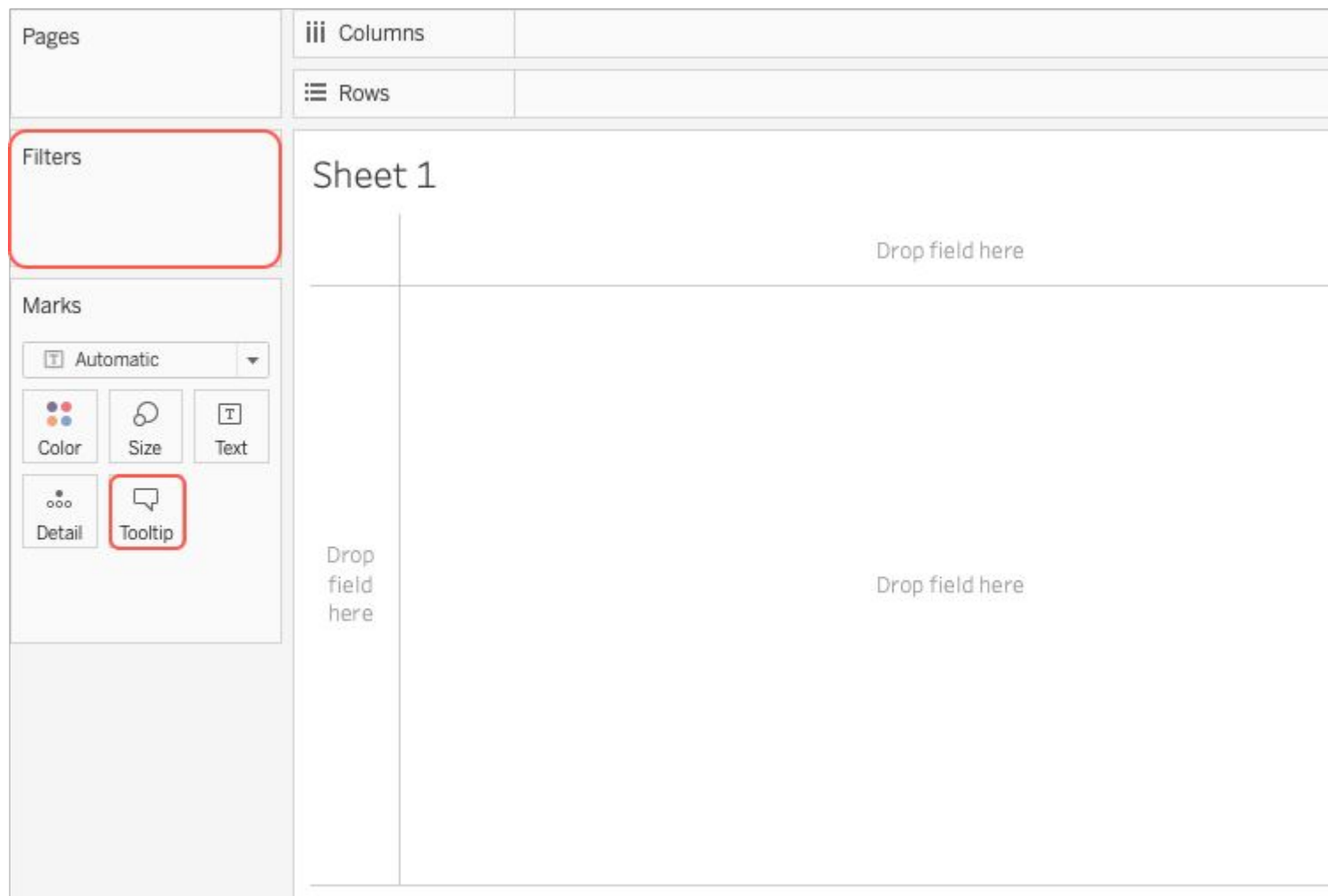
Shelves that Define the Viz LOD:



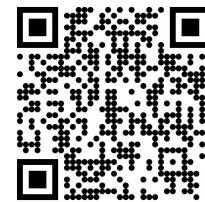
Dimensions and Measures placed here will contribute to the view level of detail



Shelves that Define the Viz LOD:



Dimensions and Measures placed here will not contribute to the view level of detail



Structure of the LOD

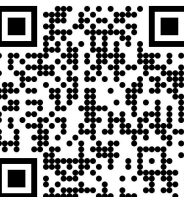
Level of Detail Expression Syntax

Three Components

Keyword

Dimensionality

Aggregation



Level of Detail Expression Syntax

Three Components

Keyword

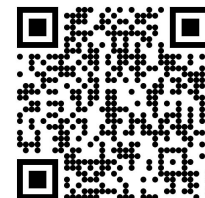
FIXED
INCLUDE
EXCLUDE

Dimensionality

(Segment) :

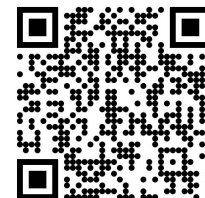
Aggregation

SUM((Sales))



Level of Detail Expression Syntax

{FIXED [Segment] : SUM([Sales])}



FIXED



How Does **FIXED** LOD Work?

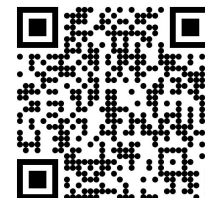
If your viz has 2 dimensions:

Segment

~~Category~~

```
{FIXED [Segment] : SUM([Sales])}
```

You will get **SUM([Sales])** for each **[Segment]**



Calc independent from the viz LOD

{FIXED [Segment] : SUM([Sales])}

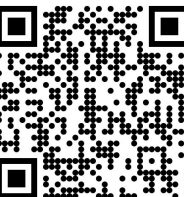
LOD Expression Returns:

Segment	
Consumer	\$1,170,660
Corporate	\$715,806
Home Office	\$440,068

Replication

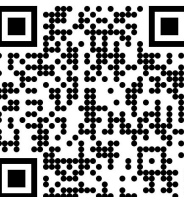
Result:

Segment	Category	
Consumer	Furniture	\$1,170,660
	Office Supplies	\$1,170,660
	Technology	\$1,170,660
Corporate	Furniture	\$715,806
	Office Supplies	\$715,806
	Technology	\$715,806
Home Office	Furniture	\$440,068
	Office Supplies	\$440,068
	Technology	\$440,068



Equivalent to **Group By** clause in SQL:

```
SELECT t1.*,  
       t2.Segment_Sales  
FROM Superstore_orders AS t1  
LEFT JOIN (  
    SELECT Segment,  
    SUM(Sales) AS Segment_Sales  
    FROM Superstore_orders  
    GROUP BY Segment  
) AS t2 ON t1.Segment = t2.Segment;
```



Challenge #1

FIXED LOD

INCLUDE

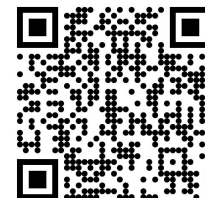
How Does **INCLUDE** LOD Work?

If your viz has this dimension:

Segment

```
{INCLUDE [Category] : SUM([Sales])}
```

You will get **SUM([Sales])** for each **[Segment]** and **[Category]**



Calc **finer** than the viz LOD

AVG({**INCLUDE** [Category] : **SUM**([Sales])})

LOD Expression Returns:

Segment	Category	
Consumer	Furniture	\$394,724
	Office Supplies	\$369,536
	Technology	\$406,400
Corporate	Furniture	\$231,268
	Office Supplies	\$236,314
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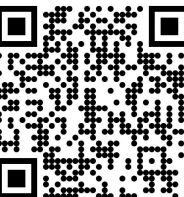
AVG

AVG

AVG

Result:

Segment	
Consumer	\$390,220
Corporate	\$238,602
Home Office	\$146,689



What if I don't use an LOD?

AVG([Sales])

Measure Values	Segment	Avg. Include LOD	Avg. Sales
AVG(Include LOD)	Consumer	\$390,220	\$222
AVG(Sales)	Corporate	\$238,602	\$232
	Home Office	\$146,689	\$241



Challenge #2

INCLUDE LOD

EXCLUDE

How Does **EXCLUDE** LOD Work?

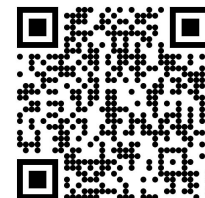
If your viz has 2 dimensions:

Segment

Category

```
{EXCLUDE [Category] : AVG([Sales])}
```

You will get **AVG([Sales])** for each **[Segment]**

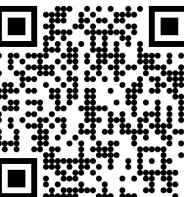


Calc **coarser** from the viz LOD

{EXCLUDE [CATEGORY] : AVG([Sales])}

LOD Expression Returns:

Segment			Segment	Category	
Consumer	\$222	Replication →	Consumer	Furniture	\$222
Corporate	\$232			Office Supplies	\$222
Home Office	\$241			Technology	\$222
			Corporate	Furniture	\$232
				Office Supplies	\$232
				Technology	\$232
			Home Office	Furniture	\$241
				Office Supplies	\$241
				Technology	\$241



Challenge #3

EXCLUDE LOD



Thank you