RATIO CALCULATIONS

It is first important to understand the way Tableau calculates the ratio. It depends on the Aggregation of the data. Therefore, it depends on the granularity or level of details of the view/viz.

Consider we have 2 Calculated Fields

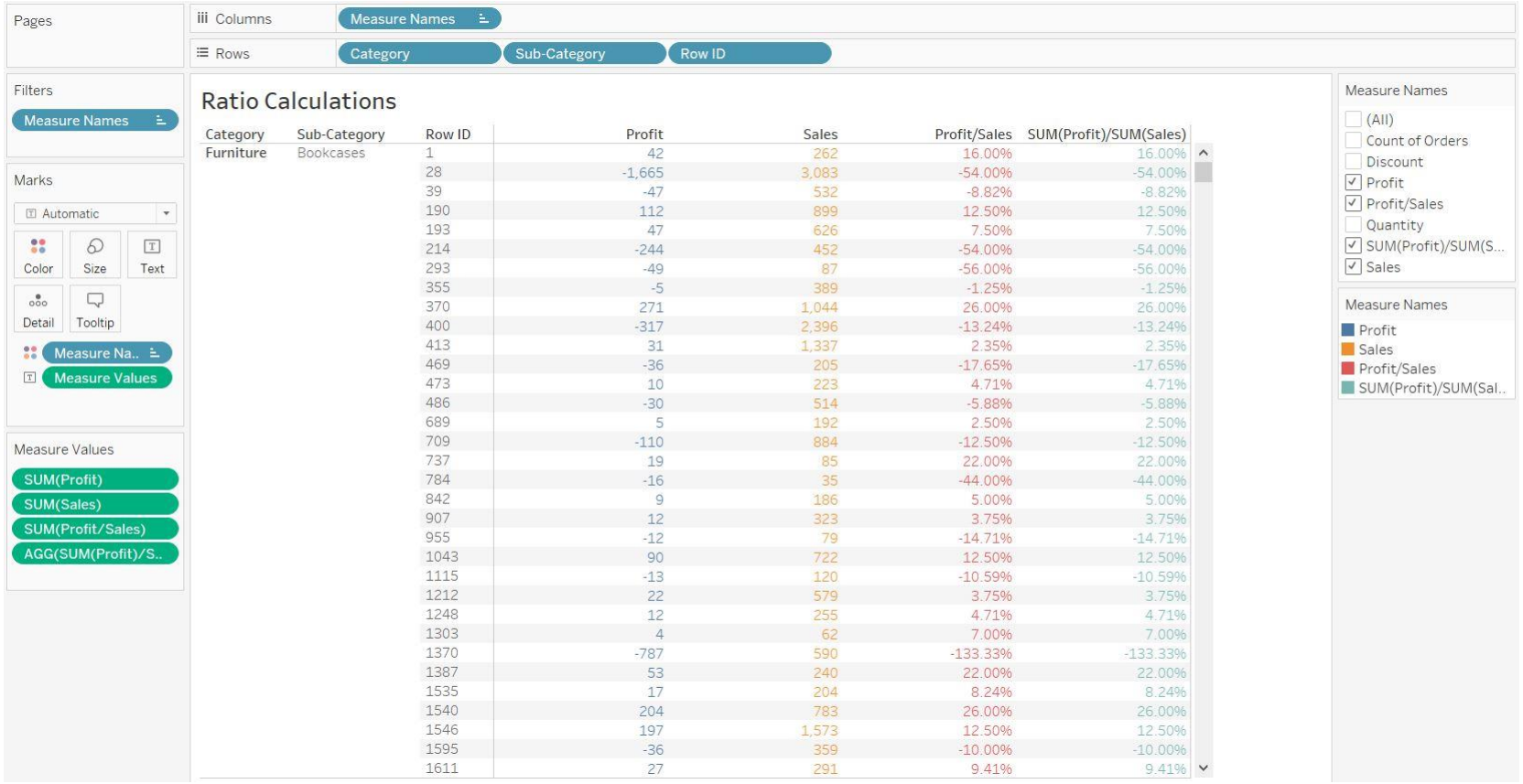
Profit/Sales : [Profit]/[Sales]
SUM(Profit)/SUM(Sales): SUM([Profit])/SUM([Sales])

RATIO CALCULATIONS

Step 1: Consider that we have these 2 calculated fields

RATIO CALCULATIONS

Step 2: Consider that we have a Viz at the Category, Sub-Category and Row ID level

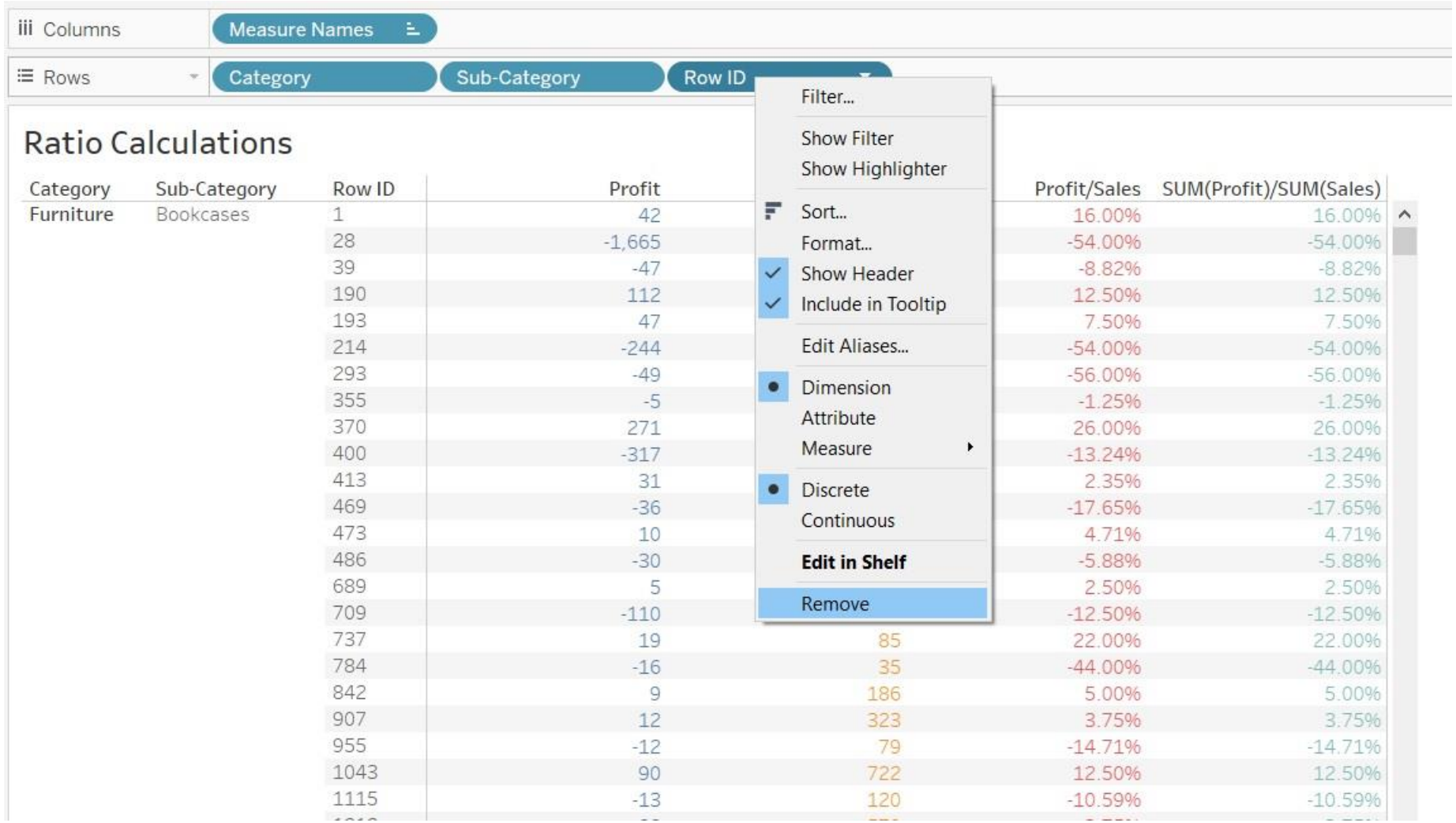


Category	Sub-Category	Row ID	Profit	Sales	Profit/Sales	SUM(Profit)/SUM(Sales)
Furniture	Bookcases	1	42	262	16.00%	16.00%
		28	-1,665	3,083	-54.00%	-54.00%
		39	-47	532	-8.82%	-8.82%
		190	112	899	12.50%	12.50%
		193	47	626	7.50%	7.50%
		214	-244	452	-54.00%	-54.00%
		293	-49	87	-56.00%	-56.00%
		355	-5	389	-1.25%	-1.25%
		370	271	1,044	26.00%	26.00%
		400	-317	2,396	-13.24%	-13.24%
		413	31	1,337	2.35%	2.35%
		469	-36	205	-17.65%	-17.65%
		473	10	223	4.71%	4.71%
		486	-30	514	-5.88%	-5.88%
		689	5	192	2.50%	2.50%
		709	-110	884	-12.50%	-12.50%
		737	19	85	22.00%	22.00%
		784	-16	35	-44.00%	-44.00%
		842	9	186	5.00%	5.00%
		907	12	323	3.75%	3.75%
		955	-12	79	-14.71%	-14.71%
		1043	90	722	12.50%	12.50%
		1115	-13	120	-10.59%	-10.59%
		1212	22	579	3.75%	3.75%
		1248	12	255	4.71%	4.71%
		1303	4	62	7.00%	7.00%
		1370	-787	590	-133.33%	-133.33%
		1387	53	240	22.00%	22.00%
		1535	17	204	8.24%	8.24%
		1540	204	783	26.00%	26.00%
		1546	197	1,573	12.50%	12.50%
		1595	-36	359	-10.00%	-10.00%
		1611	27	291	9.41%	9.41%

At the Row ID level both **Profit/Sales (Red)** and **SUM(Profit)/SUM(Sales) (Green)** provide the same results since it is at individual record level.

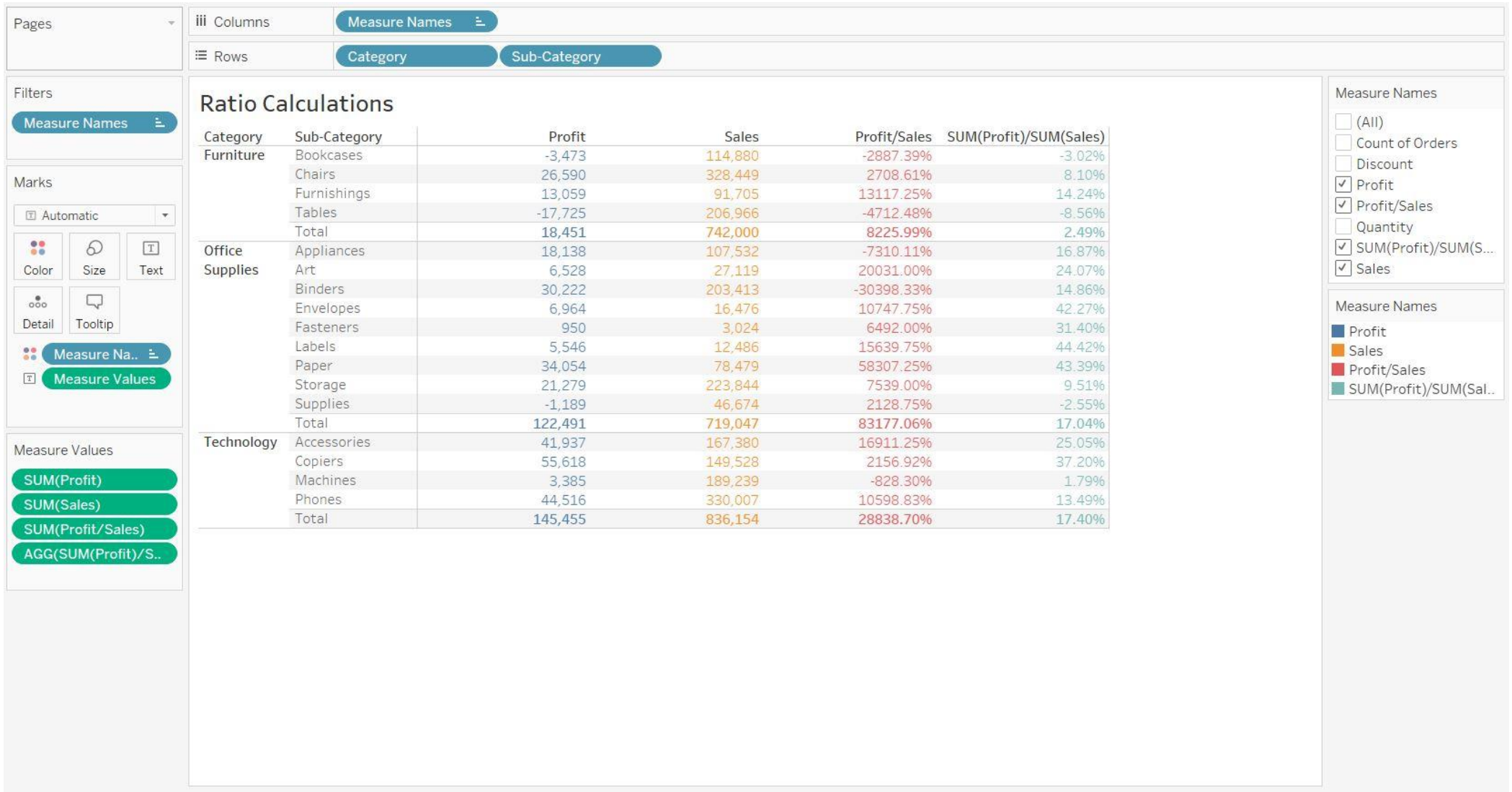
RATIO CALCULATIONS

Step 3: Right-click **Row ID** and click on **Remove**



RATIO CALCULATIONS

Step 4: Now the Viz is at the Category and Sub-Category level



Category	Sub-Category	Profit	Sales	Profit/Sales	SUM(Profit)/SUM(Sales)
Furniture	Bookcases	-3,473	114,880	-2887.39%	-3.02%
	Chairs	26,590	328,449	2708.61%	8.10%
	Furnishings	13,059	91,705	13117.25%	14.24%
	Tables	-17,725	206,966	-4712.48%	-8.56%
	Total	18,451	742,000	8225.99%	2.49%
Office Supplies	Appliances	18,138	107,532	-7310.11%	16.87%
	Art	6,528	27,119	20031.00%	24.07%
	Binders	30,222	203,413	-30398.33%	14.86%
	Envelopes	6,964	16,476	10747.75%	42.27%
	Fasteners	950	3,024	6492.00%	31.40%
	Labels	5,546	12,486	15639.75%	44.42%
	Paper	34,054	78,479	58307.25%	43.39%
	Storage	21,279	223,844	7539.00%	9.51%
	Supplies	-1,189	46,674	2128.75%	-2.55%
	Total	122,491	719,047	83177.06%	17.04%
Technology	Accessories	41,937	167,380	16911.25%	25.05%
	Copiers	55,618	149,528	2156.92%	37.20%
	Machines	3,385	189,239	-828.30%	1.79%
	Phones	44,516	330,007	10598.83%	13.49%
	Total	145,455	836,154	28838.70%	17.40%

RATIO CALCULATIONS

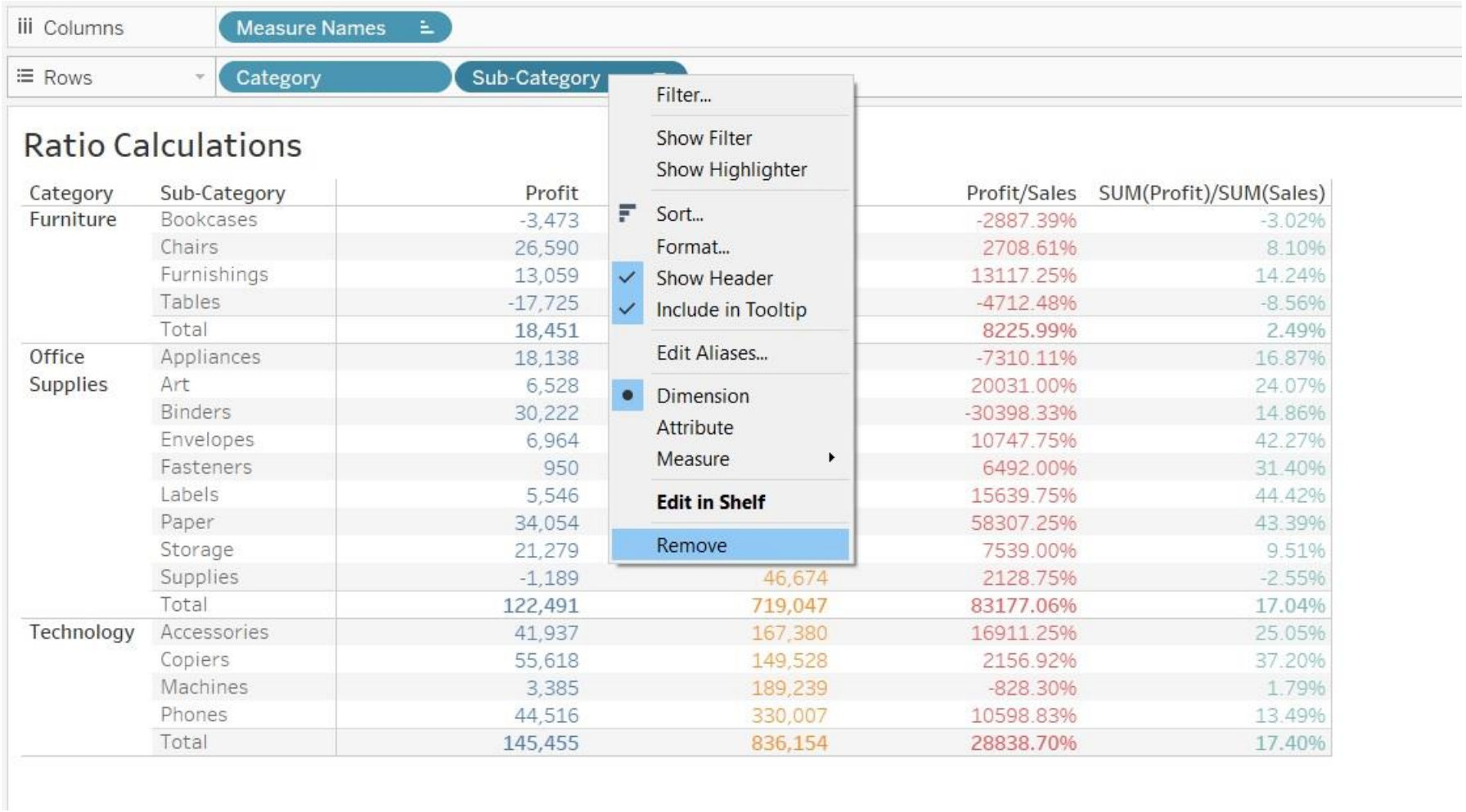
Difference between Profit/Sales and SUM(Profit)/SUM(Sales)

When we remove **Row ID** and go to the **Sub-Category** level something seems wrong with the calculations as the two ratio calculations don't match.
Profit/Sales ratio in Red results seems to be a very huge number as compared to **SUM(Profit)/SUM(Sales)** ratio in Green. Tableau aggregates the **Profit/Sales** calculation at the **row level** and then **sums the ratio** themselves which is **incorrect**.
Profit/Sales Ratio is always being calculated at the **row level or record level** and these ratios have been summed.

SUM(Profit)/SUM(Sales) however **first sums the Profit and Sale**s independently at the **granularity of the view** and then takes the **ratio of the two numbers**.
So **irrespective of the granularity** of the view the **SUM(Profit)/SUM(Sales)** calculation is always correct as the **aggregation is explicitly mentioned** in the **calculation** itself.

RATIO CALCULATIONS

Step 5: Right-click **Sub-Category** and click on **Remove**



Ratio Calculations

Category	Sub-Category	Profit		Profit/Sales	SUM(Profit)/SUM(Sales)
Furniture	Bookcases	-3,473		-2887.39%	-3.02%
	Chairs	26,590		2708.61%	8.10%
	Furnishings	13,059		13117.25%	14.24%
	Tables	-17,725		-4712.48%	-8.56%
	Total	18,451		8225.99%	2.49%
Office Supplies	Appliances	18,138		-7310.11%	16.87%
	Art	6,528		20031.00%	24.07%
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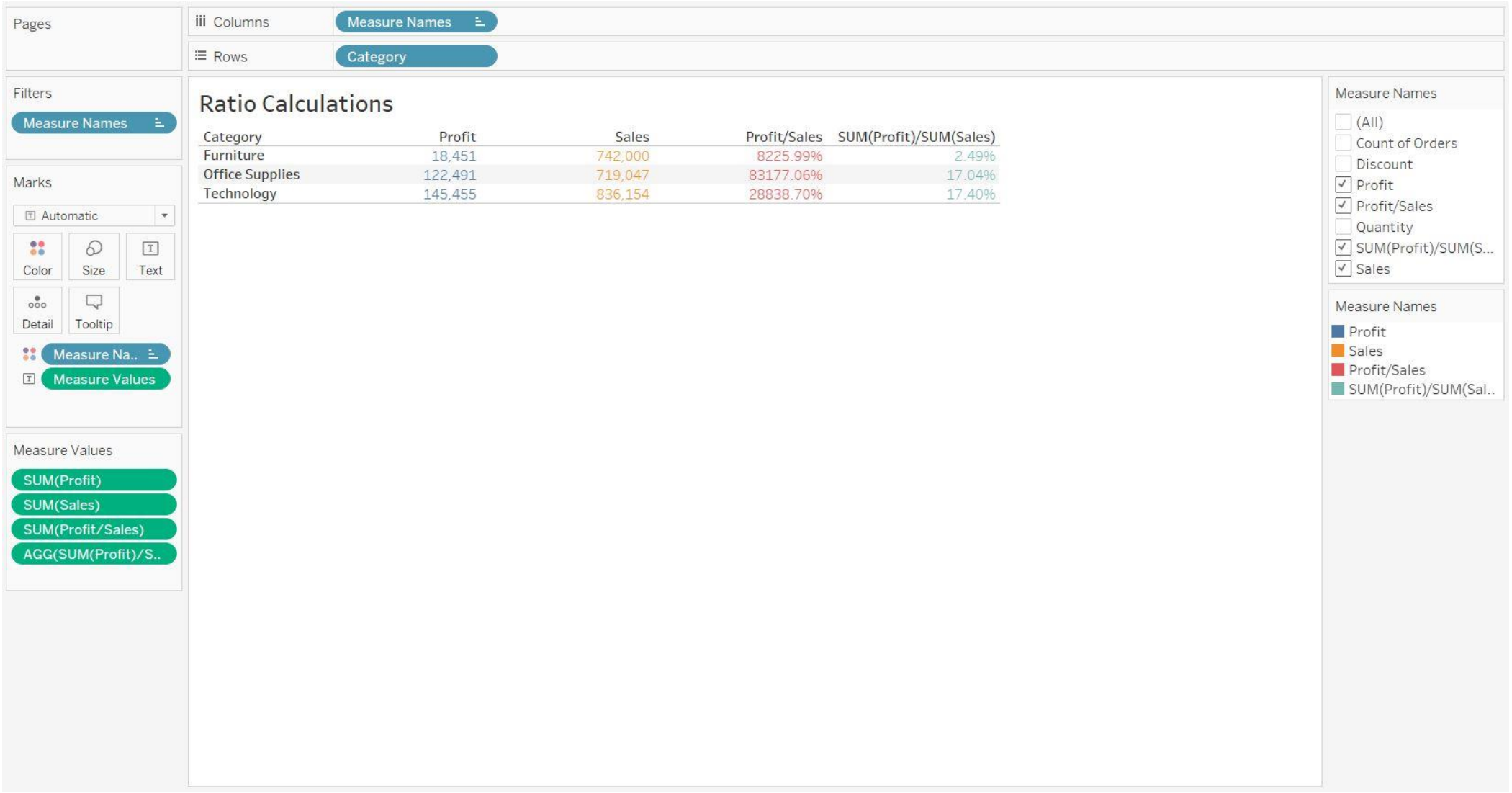
	Paper	34,054		58307.25%	43.39%
	Storage	21,279		7539.00%	9.51%
	Supplies	-1,189	46,674	2128.75%	-2.55%
	Total	122,491	719,047	83177.06%	17.04%
Technology	Accessories	41,937	167,380	16911.25%	25.05%
	Copiers	55,618	149,528	2156.92%	37.20%
	Machines	3,385	189,239	-828.30%	1.79%
	Phones	44,516	330,007	10598.83%	13.49%
	Total	145,455	836,154	28838.70%	17.40%

RATIO CALCULATIONS

Step 6: Now the Viz is at the **Category** level



RATIO CALCULATIONS

In summary **SUM(Profit)/SUM(Sales) sums** the **Profit** and **Sales** independently to whatever the **granularity of the view** is and **then computes the Ratio** at that aggregation.
This calculation will produce the **correct result irrespective of the granularity** of the view.

Profit/Sales always computes the **Profit Ratio at the lowest level of granularity** and then **sums the ratios** to the requested aggregation of the view.
This calculation will produce huge numbers that will lead to incorrect analysis.