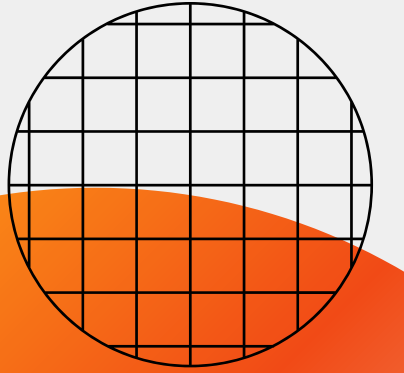# Business Intelligence Data Analysis Project
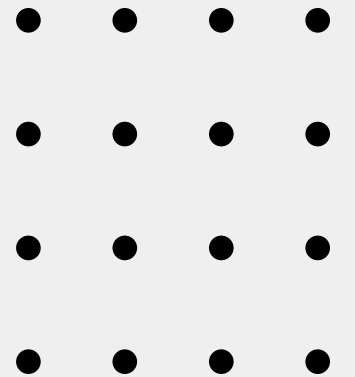
Global Super Store

Julia Phan, Emilio Cortes, Anna Do, Yen Le

Let's Start

Agenda

Global Data Analysis
China vs U.S. Region Focus
Final Recommendation

How Discounts Influence Profitability Across Product Categories

- **Filter Tool** – Removed invalid records (Sales > 0, non-null Profit and Discount).
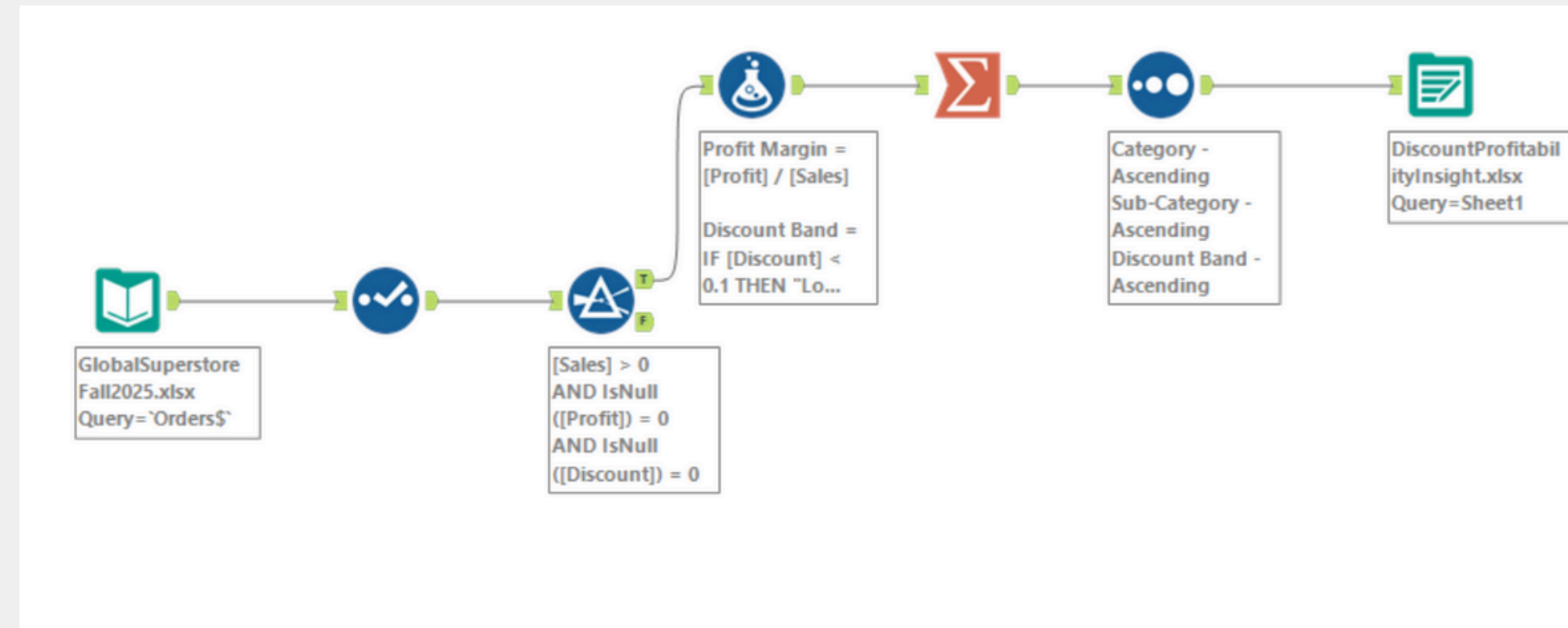
- **Formula Tool:**
  - Created new field Profit Margin = [Profit] / [Sales]
  - Created Discount Band with thresholds:
    - <10% → "Low"
    - 10–30% → "Medium"
    - ≥30% → "High"

- **Summarize Tool** – Aggregated by Category, Sub-Category, and Discount Band to calculate:
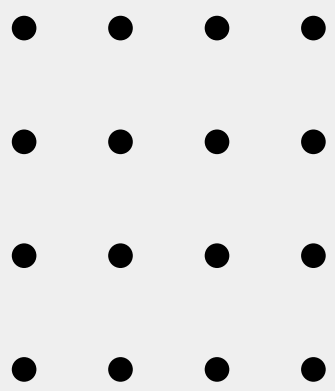 - Average Profit Margin
 - Total Sales
  - Order Count

- **Result:**
  - A 51-record dataset clearly showing profit behavior by category and discount intensity

Record	Category	Sub-Category	Discount Band	Avg_Profit Margin	Sum_Sales	Order Count
1	Furniture	Bookcases	High	-0.571885	203152.9469	545
2	Furniture	Bookcases	Low	0.24483	828932.7064	1130
3	Furniture	Bookcases	Medium	0.109149	434486.5885	610
4	Furniture	Chairs	High	-0.506642	187587.451	637
5	Furniture	Chairs	Low	0.240893	638797.6	1247
6	Furniture	Chairs	Medium	0.07234	675296.7132	1313
7	Furniture	Furnishings	High	-0.560985	49738.237	676
8	Furniture	Furnishings	Low	0.273761	254841.98	1715
9	Furniture	Furnishings	Medium	0.119347	80575.7509	565
10	Furniture	Tables	High	-0.565211	334028.4314	450
11	Furniture	Tables	Low	0.232768	261809.35	203
12	Furniture	Tables	Medium	0.038361	161204.143	183
13	Office Supplies	Appliances	High	-1.052092	95829.633	290
14	Office Supplies	Appliances	Low	0.261332	585722.84	930
15	Office Supplies	Appliances	Medium	0.142844	328983.052	456
16	Office Supplies	Art	High	-0.751453	33780.7558	746
17	Office Supplies	Art	Low	0.255646	293629.28	3031
18	Office Supplies	Art	Medium	0.113892	44203.1181	617
19	Office Supplies	Binders	High	-0.891081	57989.014	1265
20	Office Supplies	Binders	Low	0.278677	282453.87	3169
21	Office Supplies	Binders	Medium	0.250313	121426.5097	998

How Discounts Influence Profitability Across Product Categories

Discount Intensity Impact on Profitability by Category
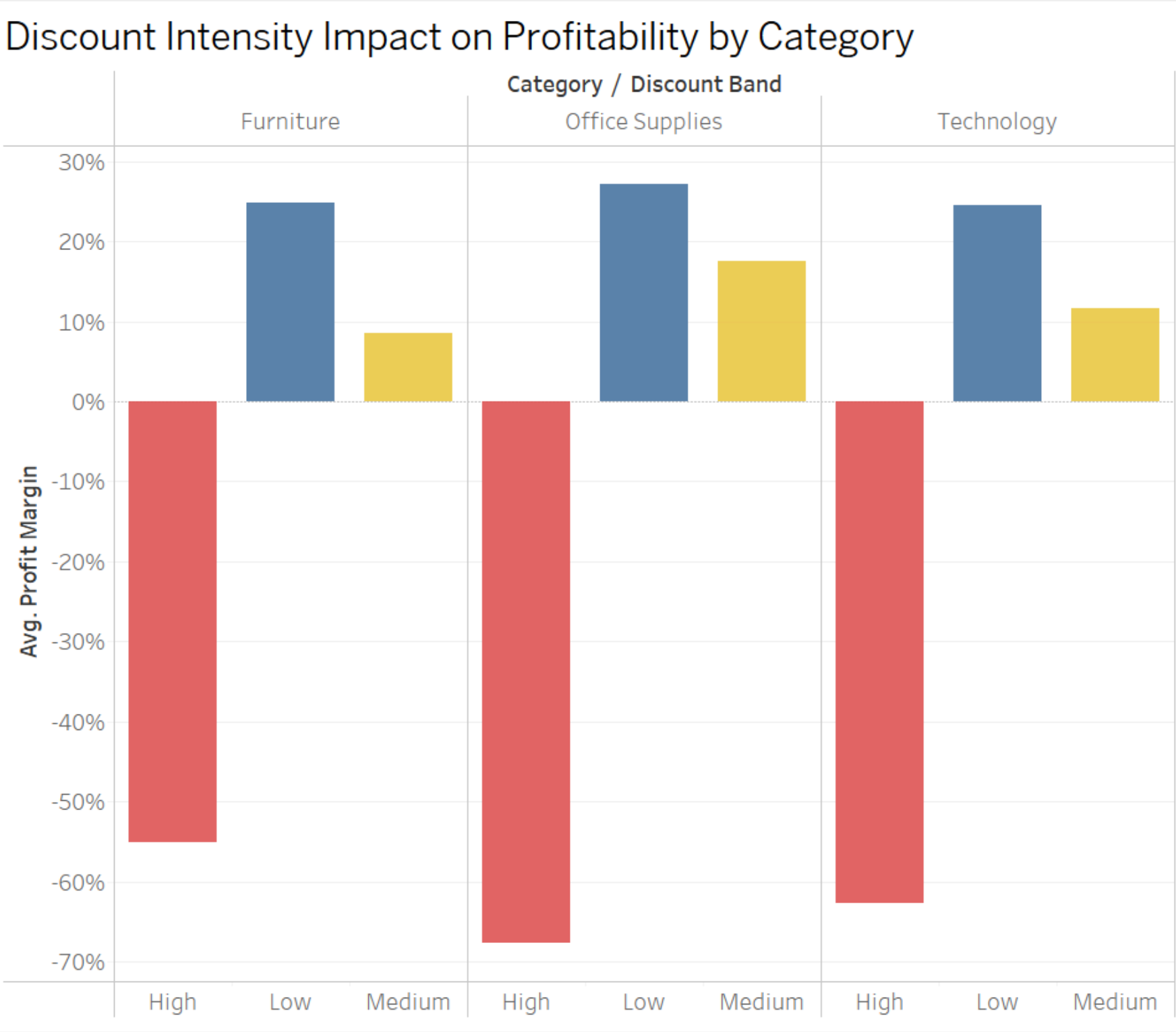
KEY FINDINGS:

- High Discounts Erode Profitability Across All Categories.
  - Sub-categories with **"High" discounts (≥30%)** see average **profit margins fall by 50–60%.**

- Low Discount Bands Yield Consistent Profitability.
  - "Low" discount segments maintain positive margins between 20–25%
    - This suggests **customers are not highly price-sensitive**

BUSINESS INTERPRETATION:

- Strategic Implication:
  - Introduce **margin-based approval rules** or **discount caps** for high-discount transactions
- Operational Recommendation:
  - Use pricing analytics to identify **optimal discount thresholds** that balance sales volume and profitability
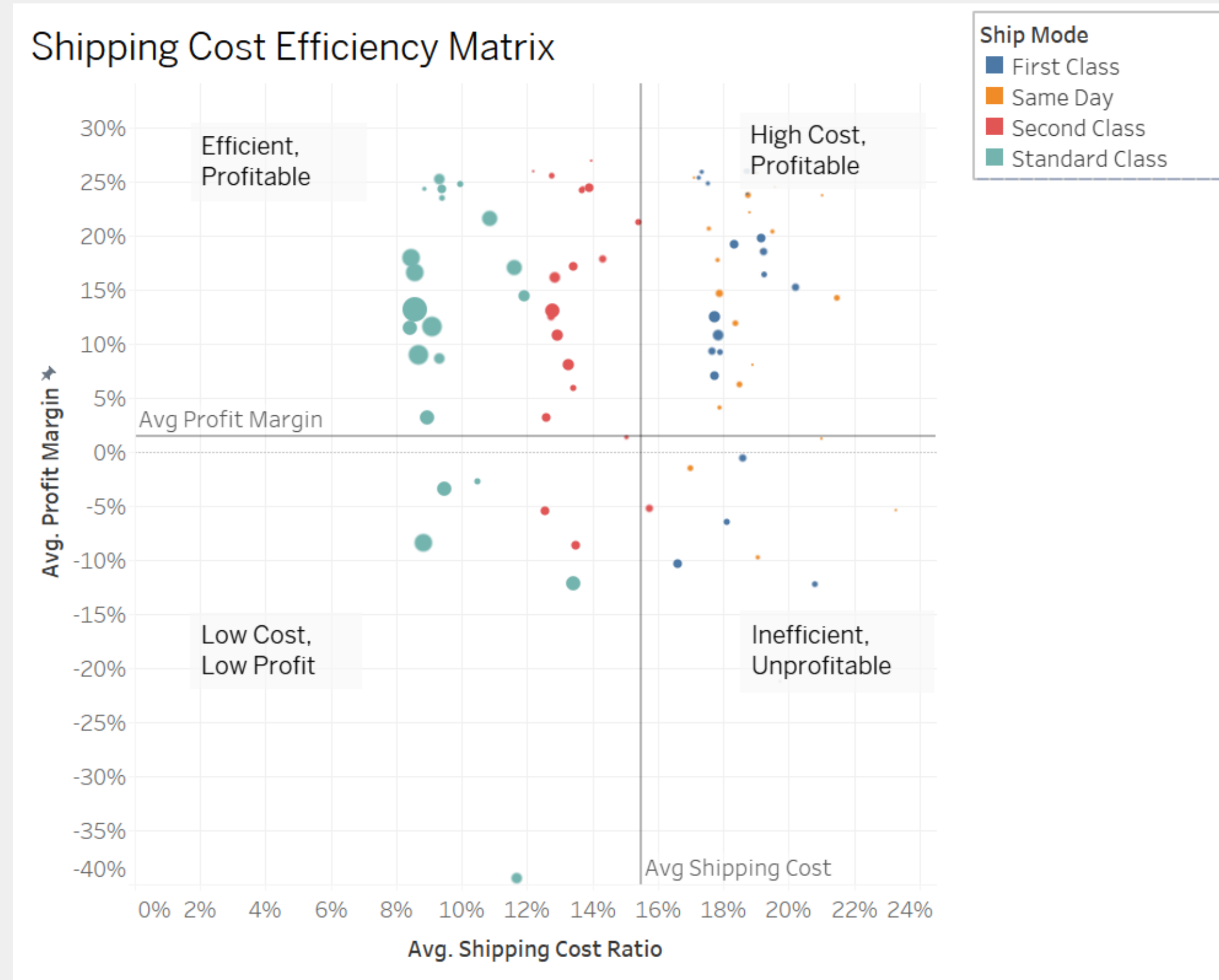
Shipping Mode Efficiency vs. Profit Margin

KEY FINDINGS:

- Standard Class dominates efficient deliveries
  - Majority of Standard Class shipments fall in the Efficient & Profitable quadrant

- First Class is high-cost but profitable
  - Indicates potential to reduce cost ratio without heavily impacting satisfaction

- Second Class and Same Day are **inefficient or low-margin**
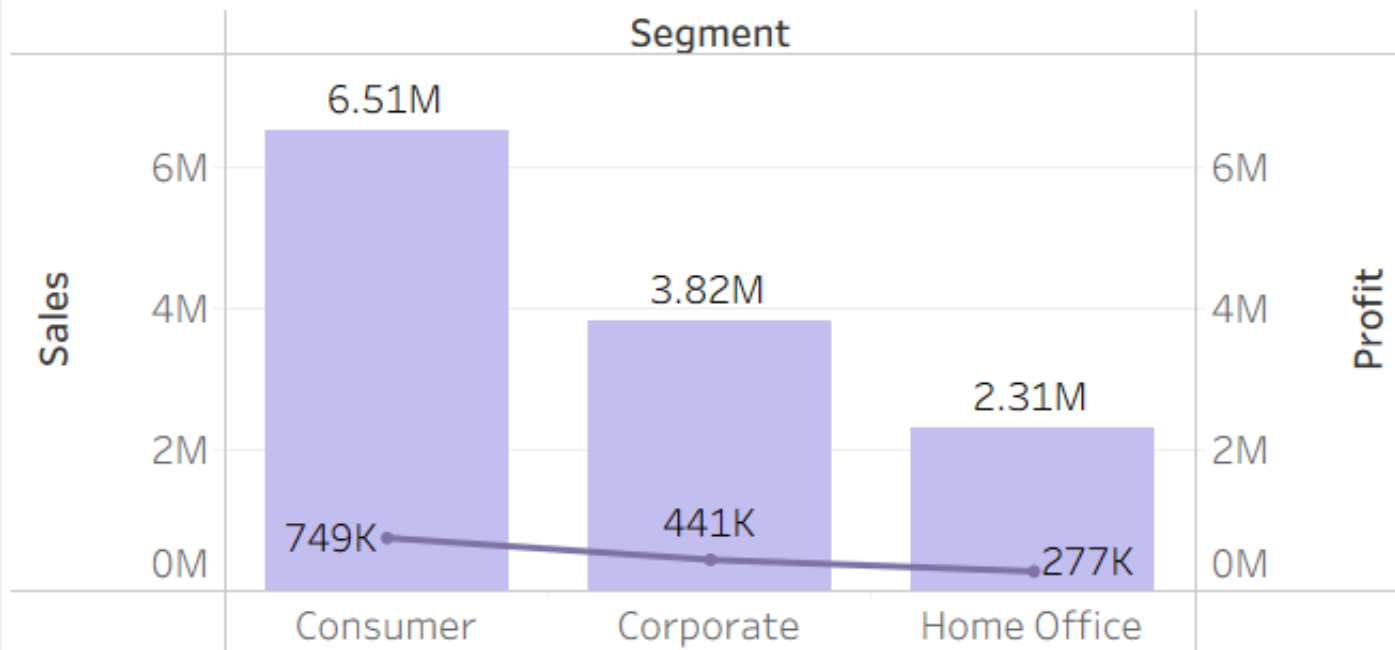 - These modes may need route optimization or pricing adjustments

BUSINESS INTERPRETATION:

- Review **Second Class** and **Same Day** logistics to control costs
- **Encourage Standard Class** for non-urgent orders to maximize margin
- Apply cost benchmarking to First and Second Class to find savings opportunities
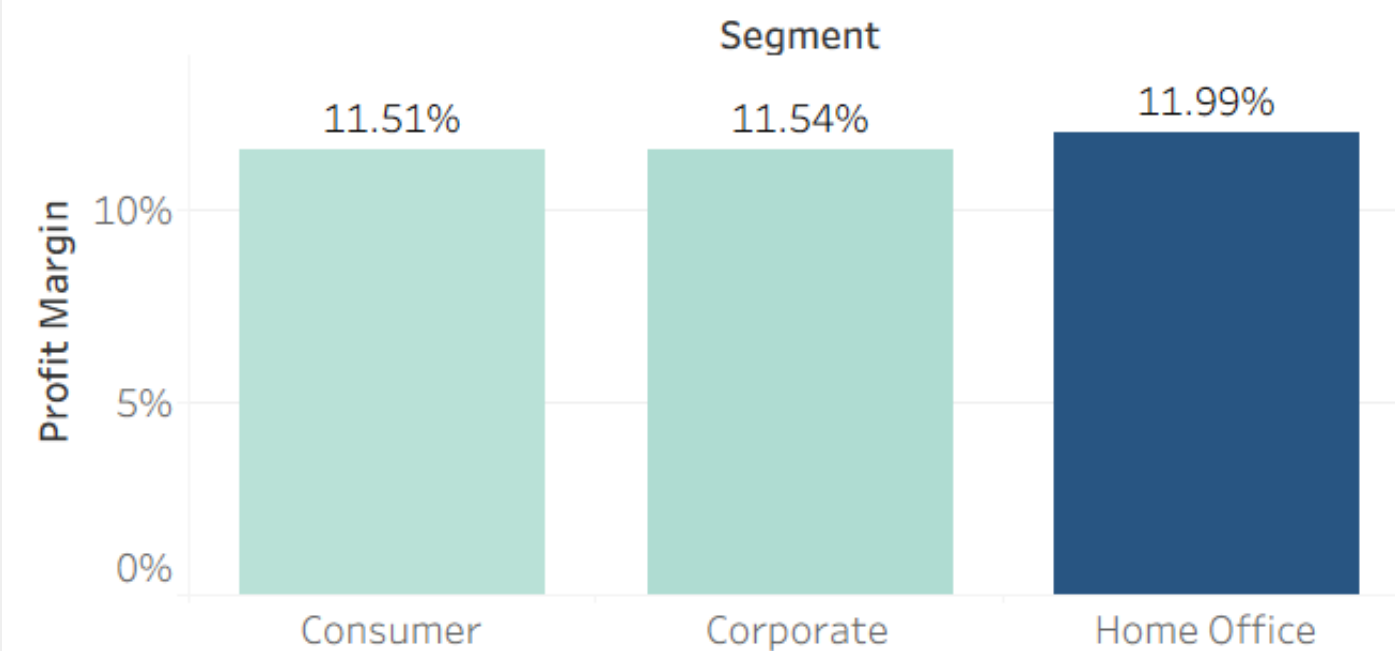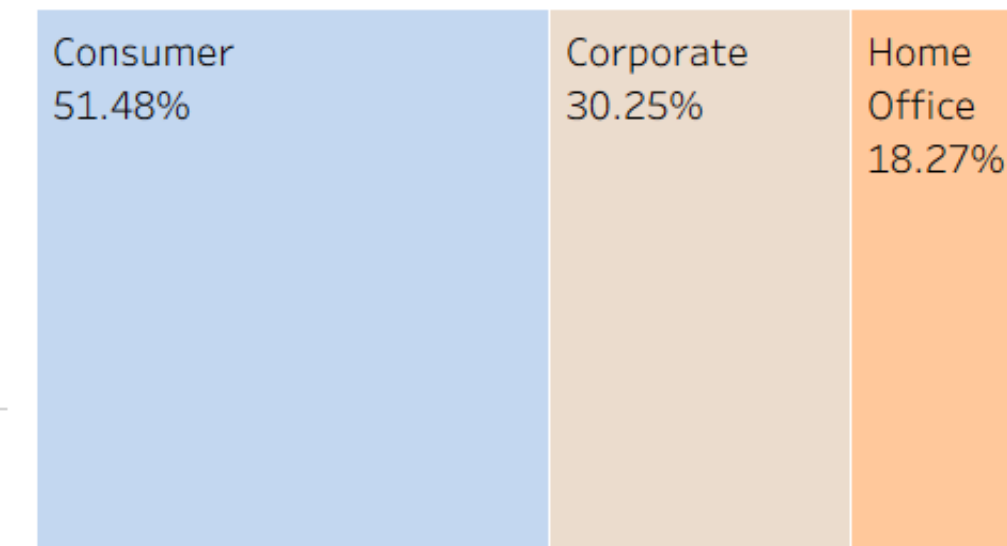

Shipping Cost Efficiency Matrix

Customer Segment

Customer Segment Breakdown

Segment
- Consumer: 6.51M (Sales), 749K (Profit)
- Corporate: 3.82M (Sales), 441K (Profit)
- Home Office: 2.31M (Sales), 277K (Profit)

Profit Margins

Segment
- Consumer: 11.51%
- Corporate: 11.54%
- Home Office: 11.99%

Measure Names
- Profit
- Sales

Segment Sales Composition (%)
- Consumer 51.48%
- Corporate 30.25%
- Home Office 18.27%

Segment Profit Composition (%)
- Consumer 51.06%
- Corporate 30.07%
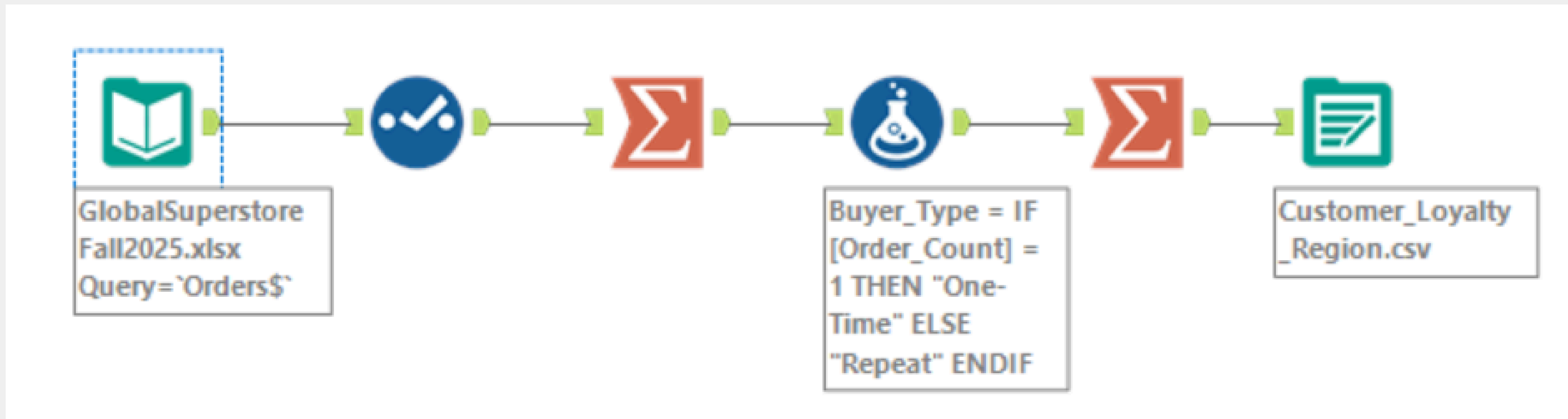- Home Office 18.88%
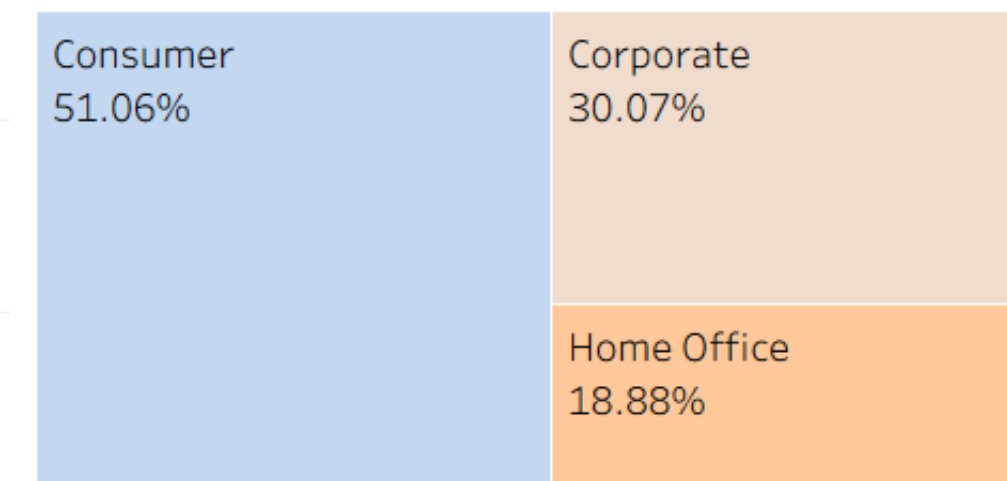
- Consumer = primary growth driver
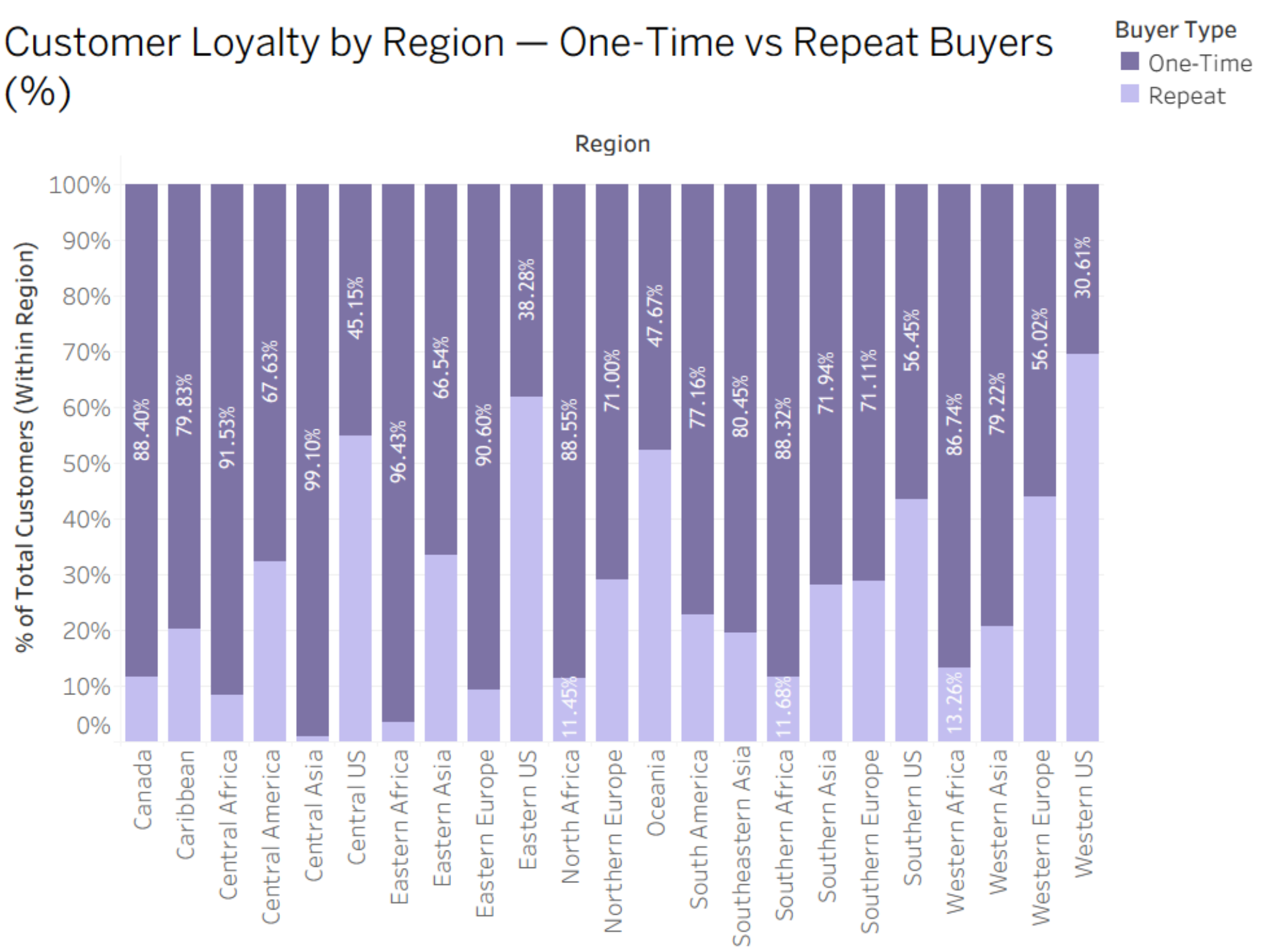- Balanced profit margins

Customer Loyalty by Region

Alteryx Workflow

Import Orders dataset → Select key fields

→ Summarize total orders per Customer and Region

→ Create **Buyer_Type** field *(One-Time/Repeat)*

→ Summarize buyer counts by Region and Buyer Type

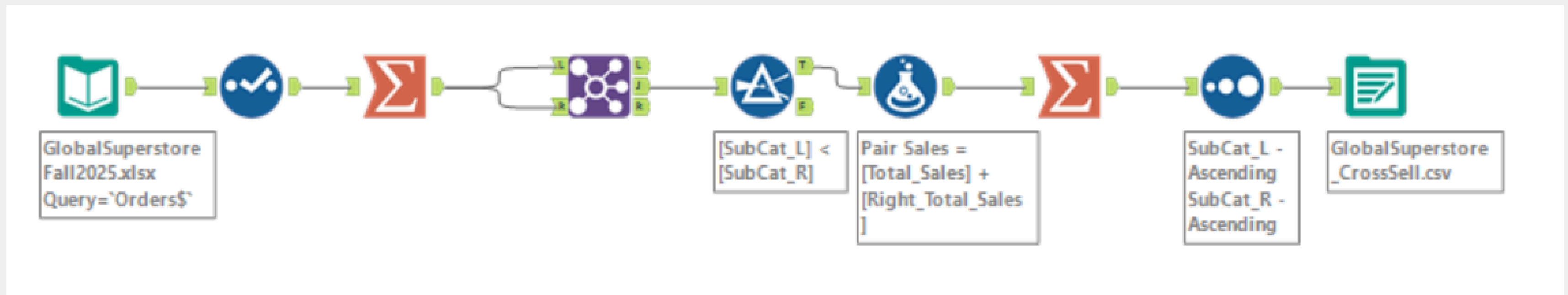→ Export

Customer Loyalty by Region

Tableau Visualization

- Most regions show a high proportion of **one-time buyers** (70–90%).
- Lowest loyalty rates: Central Asia (99%) and Eastern Africa (96%).
- Stronger repeat bases: Western Europe (56%) and Western US (30%).
- ***Next step***: analyze regional factors driving loyalty to improve customer retention strategies.

Cross-Sell Potential

Alteryx workflow

Import Orders dataset → Select key fields

→ Summarize total sales by Sub-category

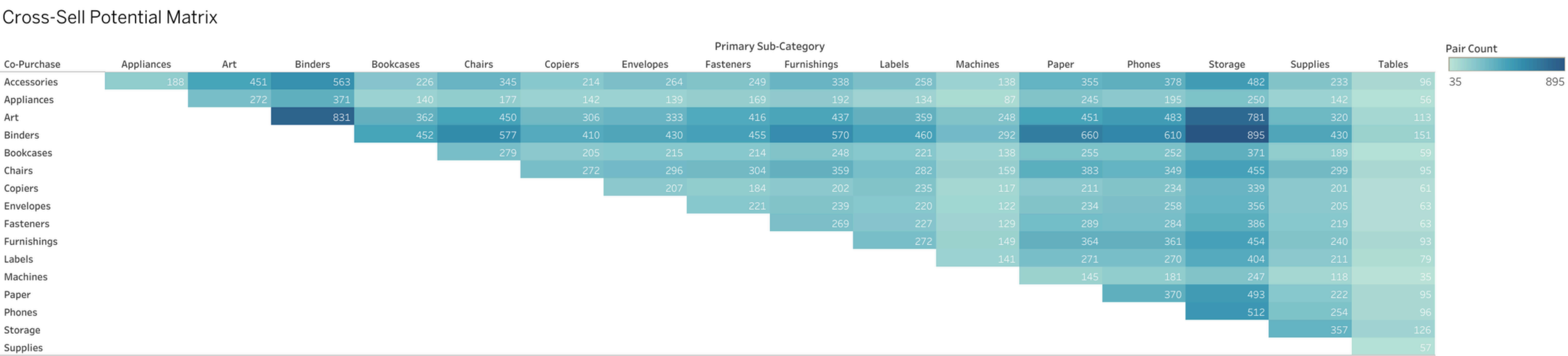→ Self-join → Filter duplicates

→ Calculate Pair Sales = [Total_Sales] + [Right_Total_Sales]

→ Summarize combined sales for each product pair

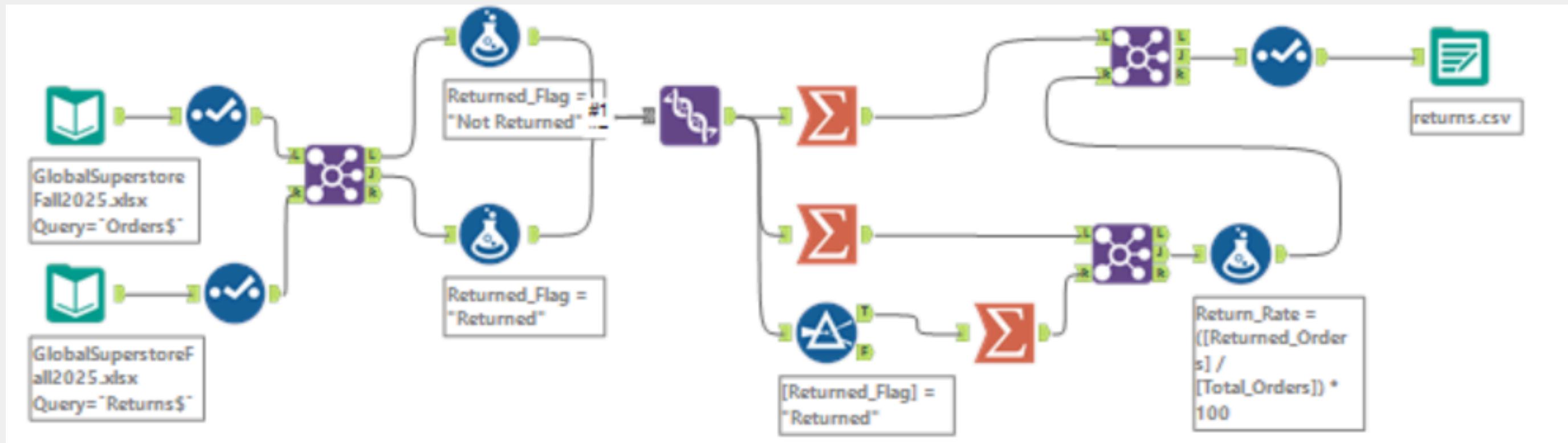→ Sort & Export

Cross-Sell Potential

Tableau visualization

- Identify strongest co-purchase relationships to launch specific bundles and promote in cart recommendations.
- Create category-based marketing campaigns.

Returns Insights

*Alteryx workflow*

Import Orders + Returns → Select key fields → Join Orders with Returns using Order ID

→ Create new field *Returned_Flag ("Returned" / "Not Returned")*

→ Merge both streams with Union

→ Summarize average profits by Category

→ Filter for *Returned* records → Join summarized totals with return counts

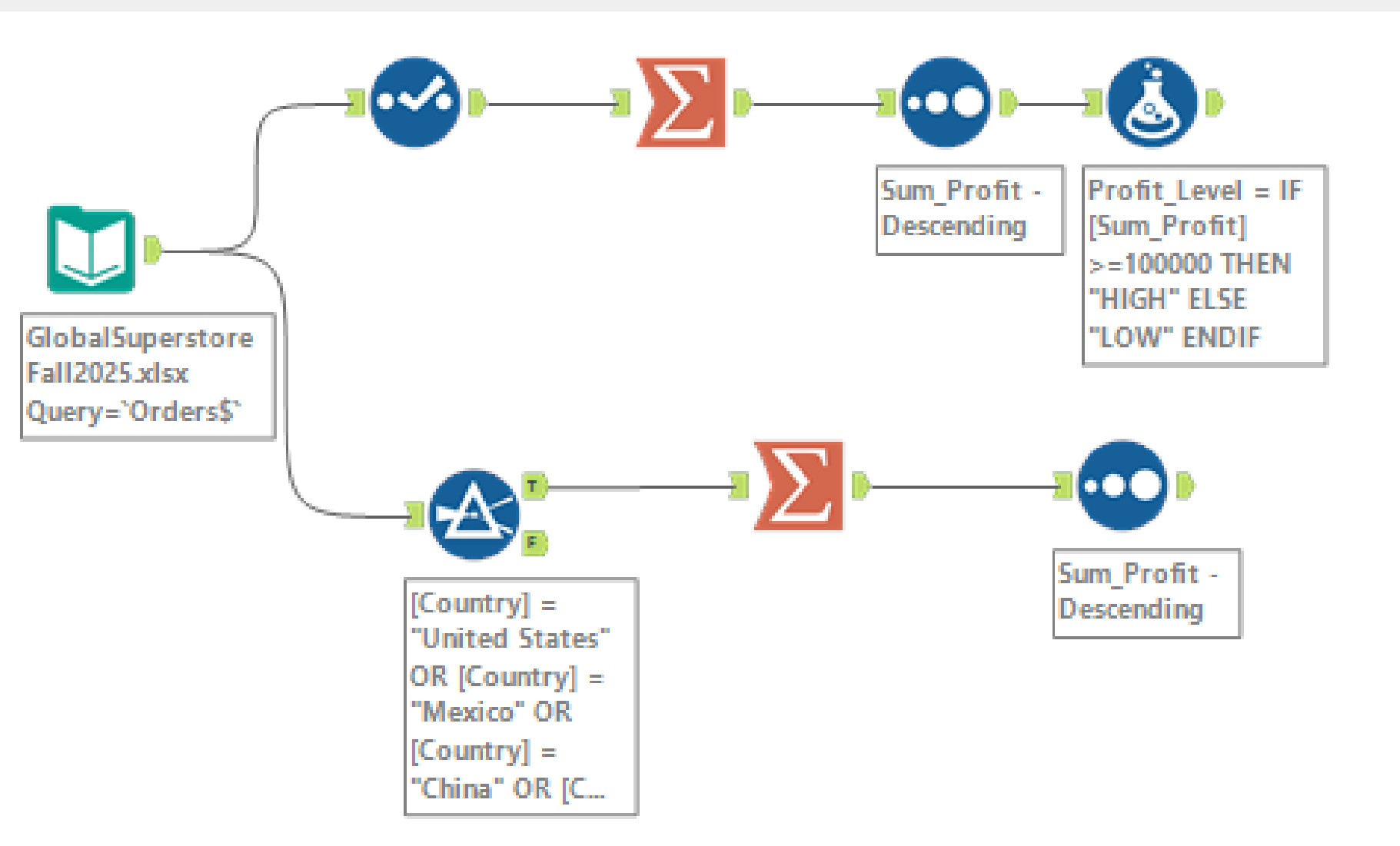→ Calculate Return Rate → Export for Tableau

# Returns Insights

Tableau visualization
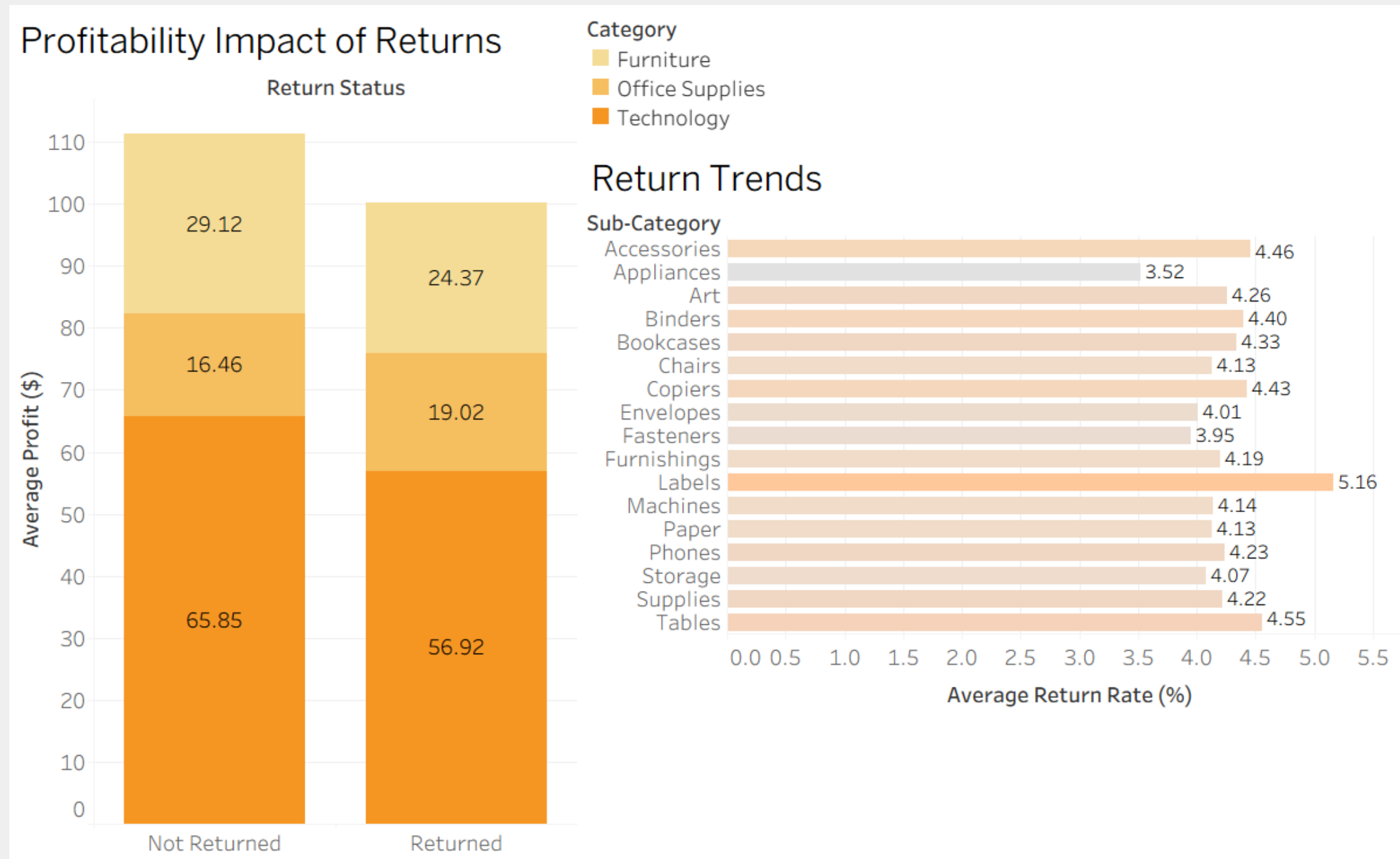
- Returns lower average profits in Technology and Furniture.
- Office Supplies shows a slight profit increase despite returns — possibly due to restocking or margin resilience.
- Labels (5.16%) and Tables (4.55%) have the highest return rates.
- Focus on reducing returns in high-value categories to sustain profitability.
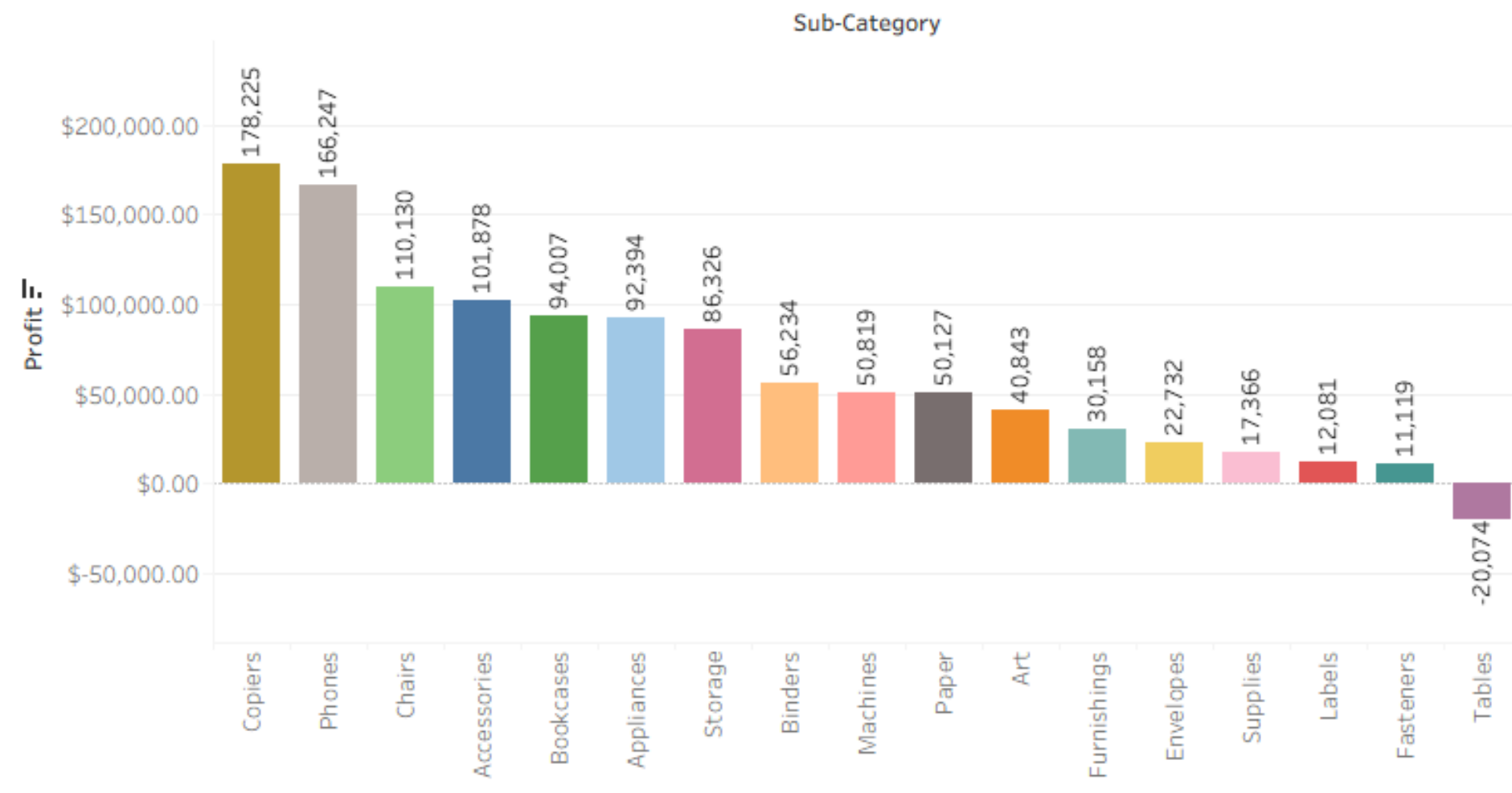
Profitability By Country

GlobalSuperstore
Fall2025.xlsx
Query=`Orders$`

Sum_Profit -
Descending

Profit_Level = IF
[Sum_Profit]
>=100000 THEN
"HIGH" ELSE
"LOW" ENDIF

[Country] =
"United States"
OR [Country] =
"Mexico" OR
[Country] =
"China" OR [C...

Sum_Profit -
Descending

Record	Sub-Category	Sum_Profit
1	Copiers	178225.04342
2	Phones	166246.7246
3	Chairs	110129.7303
4	Accessories	101878.1317
5	Bookcases	94006.615
6	Appliances	92393.7007

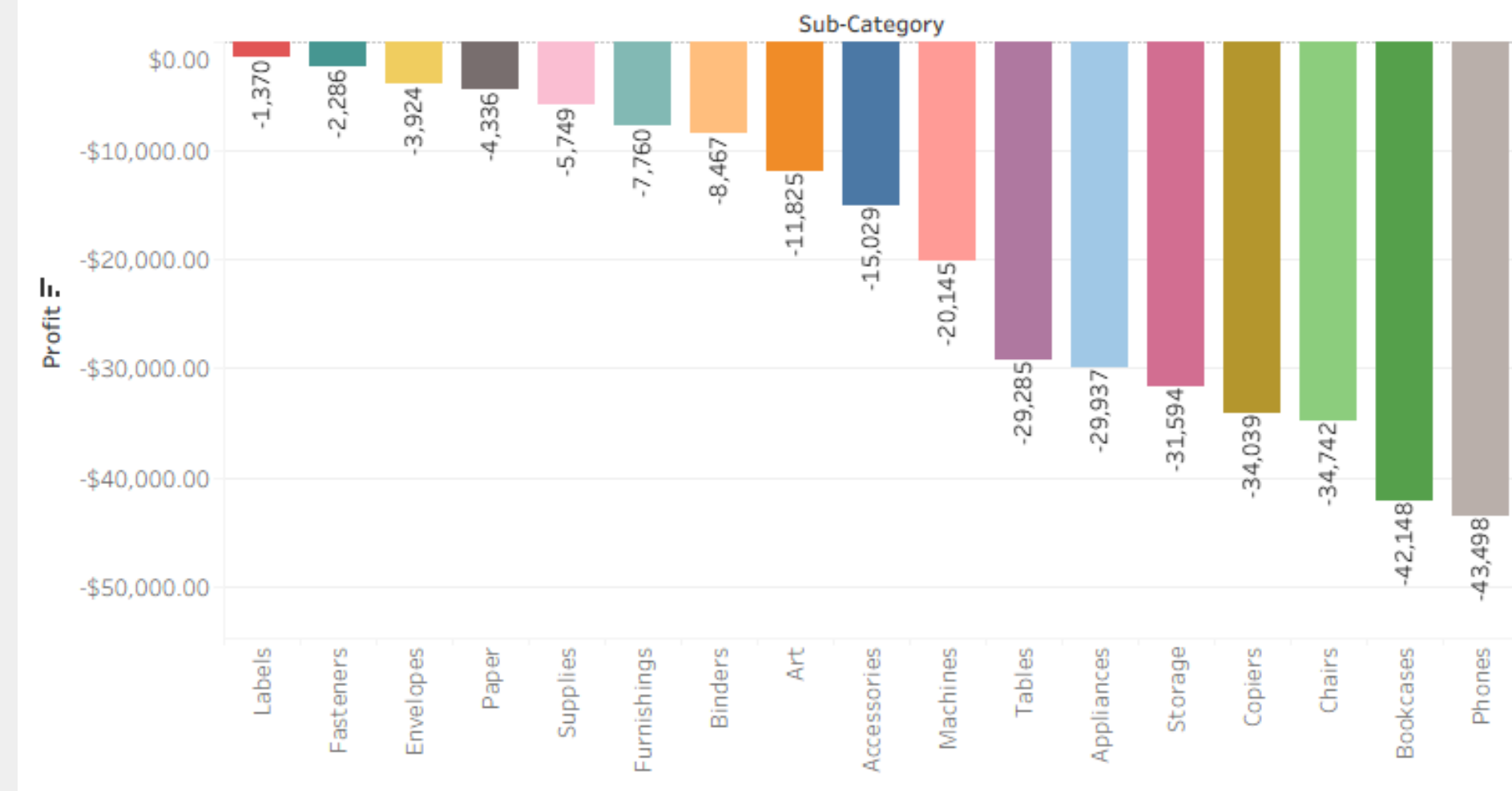| Record	Country	Sum_Profit	Sum_Sales	Profit_Level
1	United States	286397.0217	2297200.8603	HIGH
2	China	150683.085	700562.025	HIGH
3	India	129050.595	589486.035	HIGH
4	United Kingdom	111900.15	528576.3	HIGH
5	France	109029.003	858931.083	HIGH
6	Germany	107190.3255	628136.1855	HIGH
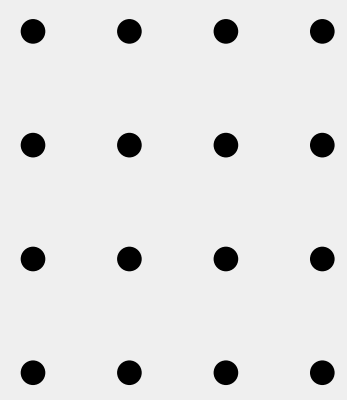
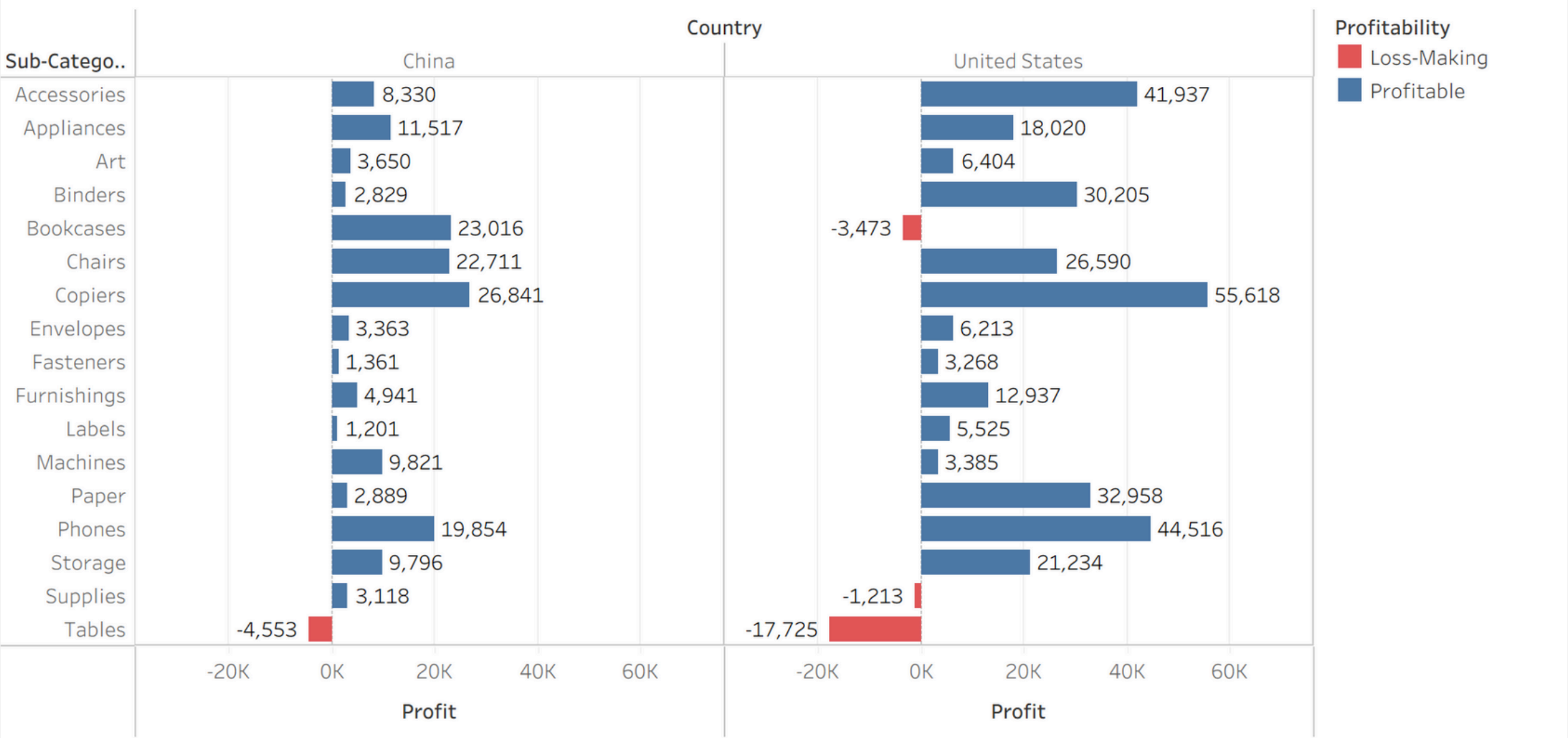# Most Profitable vs Less Profitable Countries (Sub-Category)

Profit by sub-category (Top 8 countries)

Sub-Category

Sub-Category	Profit
Copiers	178,225
Phones	166,247
Chairs	110,130
Accessories	101,878
Bookcases	94,007
Appliances	92,394
Storage	86,326
Binders	56,234
Machines	50,819
Paper	50,127
Art	40,843
Furnishings	30,158
Envelopes	22,732
Supplies	17,366
Labels	12,081
Fasteners	11,119
Tables	-20,074

Profit by sub-category (bottom 8 countries)

Sub-Category

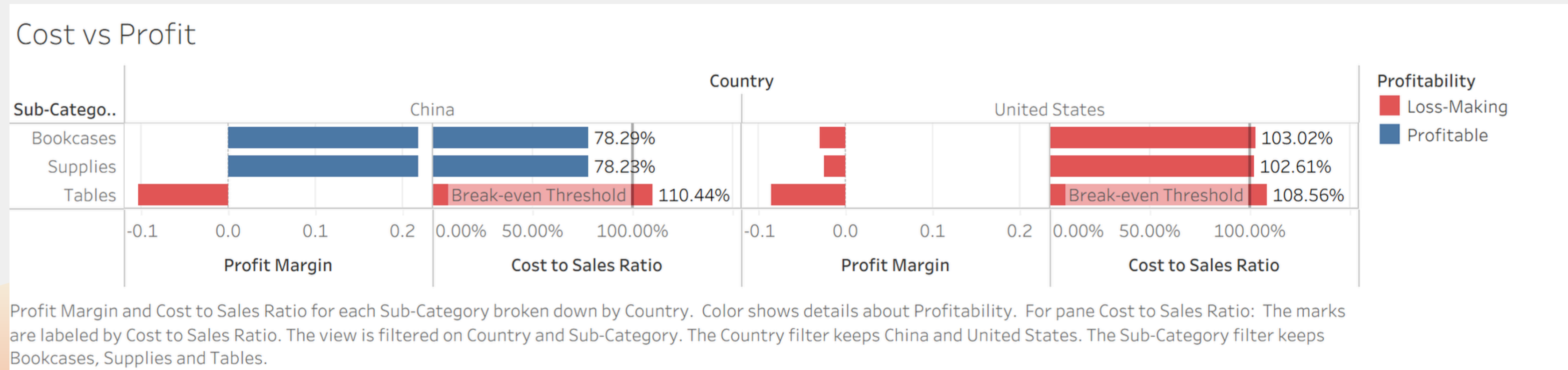| Sub-Category	Profit
Labels	-1,370
Fasteners	-2,286
Envelopes	-3,924
Paper	-4,336
Supplies	-5,749
Furnishings	-7,760
Binders	-8,467
Art	-11,825
Accessories	-15,029
Machines	-20,145
Tables	-29,285
Appliances	-29,937
Storage	-31,594
Copiers	-34,039
Chairs	-34,742
Bookcases	-42,148
Phones	-43,498

Profit Breakdown (China vs U.S.)

Sum of Profit for each Sub-Category broken down by Country. Color shows details about Profitability. The marks are labeled by sum of Profit. Details are shown for Sub-Category. The view is filtered on Country, which keeps China and United States.
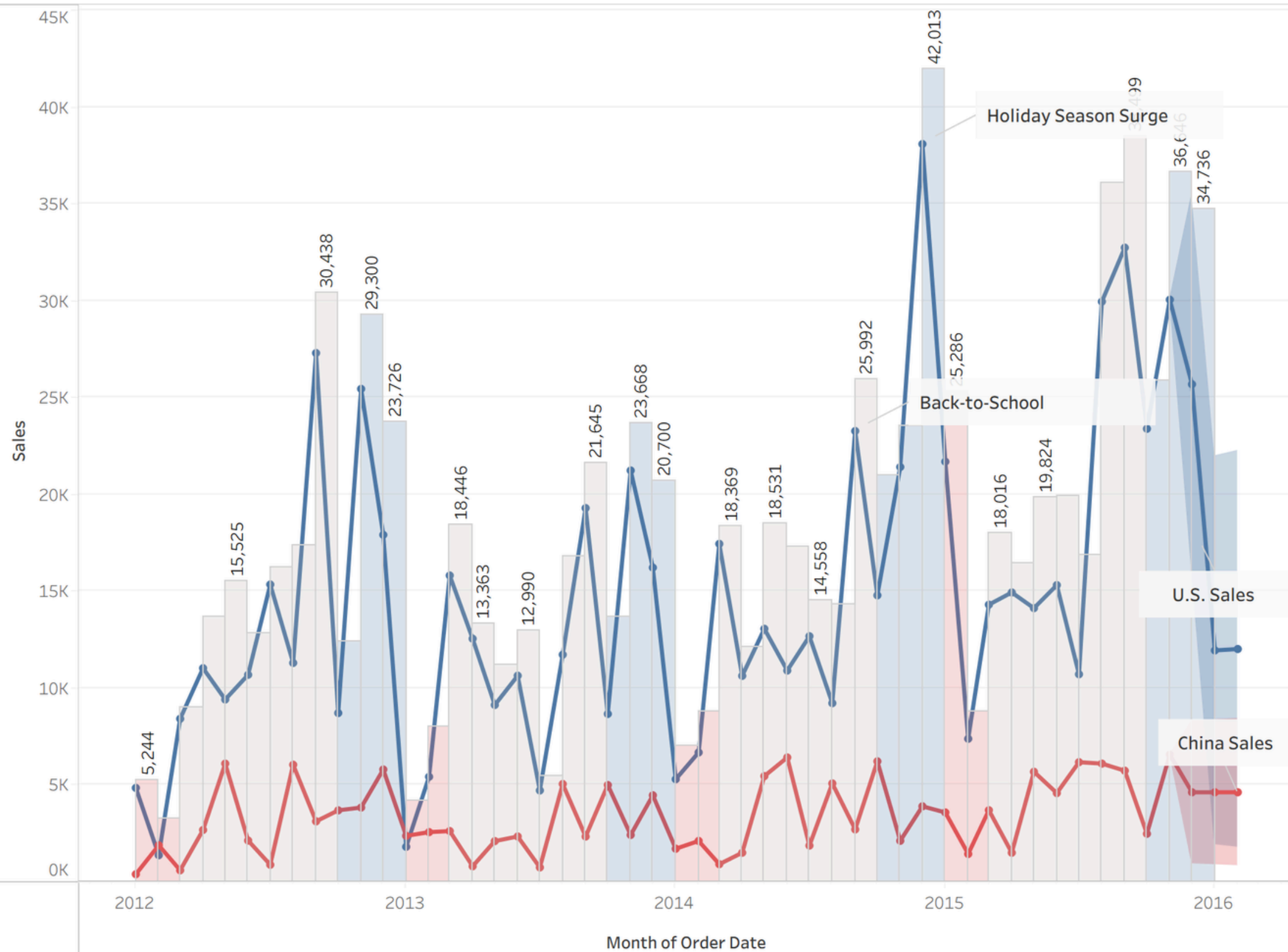
- U.S. losses in Tables (–$17.7K) and Bookcases (–$3.4K) — cost-heavy furniture.
- China controls costs better but still loses on Tables
- Both markets show inefficiency in bulky products, needing cost review.

Cost-to-Sales Ratio (China vs U.S.)

Cost vs Profit

Profit Margin and Cost to Sales Ratio for each Sub-Category broken down by Country. Color shows details about Profitability. For pane Cost to Sales Ratio: The marks are labeled by Cost to Sales Ratio. The view is filtered on Country and Sub-Category. The Country filter keeps China and United States. The Sub-Category filter keeps Bookcases, Supplies and Tables.

- Both U.S. & China exceed 100% cost-to-sales threshold on Tables
- Main cause: High material and shipping costs for bulky items
- Strategy: Outsource production and use modular designs to cut costs.
- Goal: Lower total production costs and recover profit margins.

Seasonal Sales Trends

- U.S.: 3 peaks — Mar (Spring), Sep (Back-to-School), Nov (Holiday)
- China: Volatile, promotion-driven (e.g., Singles' Day)
- Forecast (next 3 months of 2016): Pattern continues — steady U.S. growth, irregular China spikes
- Implication: Plan inventory & campaigns by market habit

Final Recommendations

- **Operations:** Reassess low-performing markets; optimize loss-making categories.
- **Shipping:** Prioritize cost-efficient modes; limit express delivery.
- **Products:** Focus on high-margin items; reduce materials and bulk costs.
- **Pricing:** Keep discounts under 30% to protect margins.
- **Customers:** Stregnthen loyalty and cross-sell programs.
- **Returns:** Reduce return rates in Furniture & Tech.
- **Regions:** Improve U.S. efficiency; apply China's lean model and seasonal planning

End

Thank you

Do you have any questions?