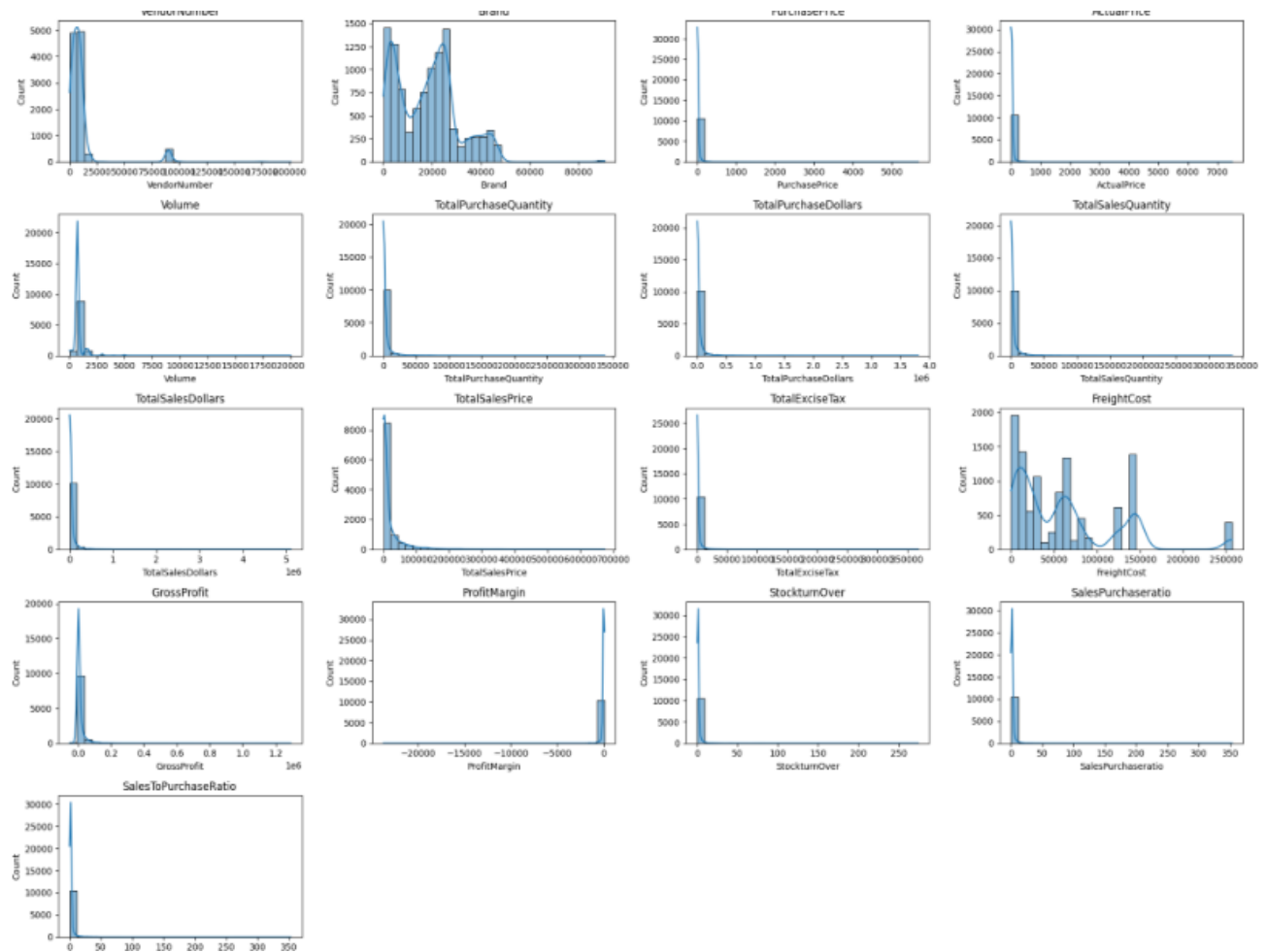


Summary Statistics

	count	mean	std	min	25%	50%	75%	max
VendorNumber	10692.0	1.065065e+04	18753.519148	2.00	3951.000000	7153.000000	9552.000000	2.013590e+05
Brand	10692.0	1.803923e+04	12662.187074	58.00	5793.500000	18761.500000	25514.250000	9.063100e+04
PurchasePrice	10692.0	2.438530e+01	109.269375	0.36	6.840000	10.455000	19.482500	5.681810e+03
ActualPrice	10692.0	3.564367e+01	148.246016	0.49	10.990000	15.990000	28.990000	7.499990e+03
Volume	10692.0	8.473605e+02	664.309212	50.00	750.000000	750.000000	750.000000	2.000000e+04
TotalPurchaseQuantity	10692.0	3.140887e+03	11095.086769	1.00	36.000000	262.000000	1975.750000	3.376600e+05
TotalPurchaseDollars	10692.0	3.010669e+04	123067.799627	0.71	453.457500	3655.465000	20738.245000	3.811252e+06
TotalSalesQuantity	10692.0	3.077482e+03	10952.851391	0.00	33.000000	261.000000	1929.250000	3.349390e+05
TotalSalesDollars	10692.0	4.223907e+04	167655.265984	0.00	729.220000	5298.045000	28396.915000	5.101920e+06
TotalSalesPrice	10692.0	1.879378e+04	44952.773386	0.00	289.710000	2857.800000	16059.562500	6.728193e+05
TotalExciseTax	10692.0	1.774226e+03	10975.582240	0.00	4.800000	46.570000	418.650000	3.682428e+05
FreightCost	10692.0	6.143376e+04	60938.458032	0.09	14069.870000	50293.620000	79528.990000	2.570321e+05
GrossProfit	10692.0	1.213238e+04	46224.337964	-52002.78	52.920000	1399.640000	8660.200000	1.290668e+06
ProfitMargin	10692.0	-inf	NaN	-inf	13.324515	30.405457	39.956135	9.971666e+01
StockturnOver	10692.0	1.706793e+00	6.020460	0.00	0.807229	0.981529	1.039342	2.745000e+02
SalesPurchaseratio	10692.0	2.504390e+00	8.459067	0.00	1.153729	1.436894	1.665449	3.529286e+02
SalesToPurchaseRatio	10692.0	2.504390e+00	8.459067	0.00	1.153729	1.436894	1.665449	3.529286e+02



• Negative & Zero Values:

- **Gross Profit:** The minimum recorded value is **-52,002.78**, reflecting losses. This indicates certain products or transactions are being sold below cost, either due to high expenses or heavy discounting.
- **Profit Margin:** The minimum value is $-\infty$, which highlights cases where revenue is zero or even less than costs.
- **Total Sales Quantity & Sales Dollars:** Both have a minimum of **0**, meaning some products were purchased but never sold — possibly due to being slow-moving or obsolete stock.
- Outliers Highlighted by High Standard Deviations:
- **Purchase & Actual Prices:** Maximum values (**5,681.81 & 7,499.99**) are much higher than the mean (**24.39 & 35.64**), suggesting premium or outlier products.
- **Freight Cost:** Extremely wide variation (**0.09 to 257,032.07**) suggests inefficiencies in logistics or cases of bulk shipping.

- **Stock Turnover:** Ranges from **0 to 274.5**, implying some products sell very quickly while others remain unsold indefinitely. A value greater than **1** indicates sold quantity exceeds purchased quantity — likely because orders are being fulfilled from old inventory.

Data Filtering

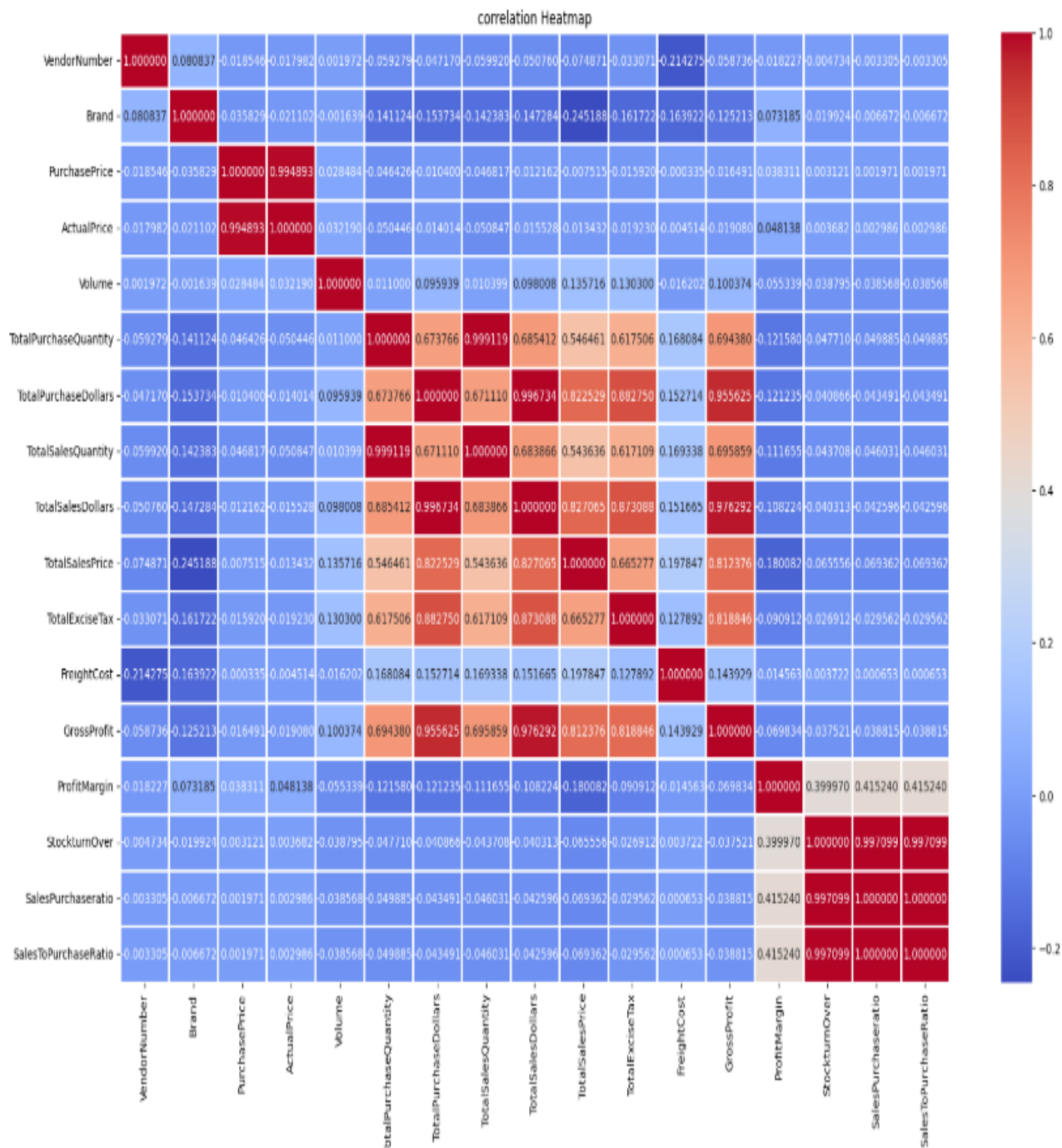
To improve the ****accuracy and reliability of insights****, we excluded inconsistent data points based on the following conditions:

- ****Gross Profit ≤ 0 **** → Removed to avoid transactions that resulted in losses.
- ****Profit Margin ≤ 0 **** → Excluded to ensure the analysis focuses only on profitable transactions.
- ****Total Sales Quantity = 0**** → Filtered out to eliminate inventory items that were purchased but never sold.

Correlation Insights

- **Purchase Price** shows weak correlations with **Total Sales Dollars (-0.012)** and **Gross Profit (-0.016)**, indicating that price fluctuations have little effect on revenue or profitability.
- There is a **very strong correlation (0.999)** between total purchase quantity and total sales quantity, suggesting highly efficient inventory movement.
- A **negative correlation (-0.179)** exists between profit margin and total sales price, implying that as sales prices rise, profit margins tend to shrink — likely due to competitive pricing strategies.

Stock Turnover has weak negative correlations with both **Gross Profit (-0.038)** and **Profit Margin (-0.055)**, meaning that faster turnover doesn't automatically translate into higher profits.



Identify Brands that needs Promotional or Pricing Adjustments which exhibit lower sales performance but higher profit margin

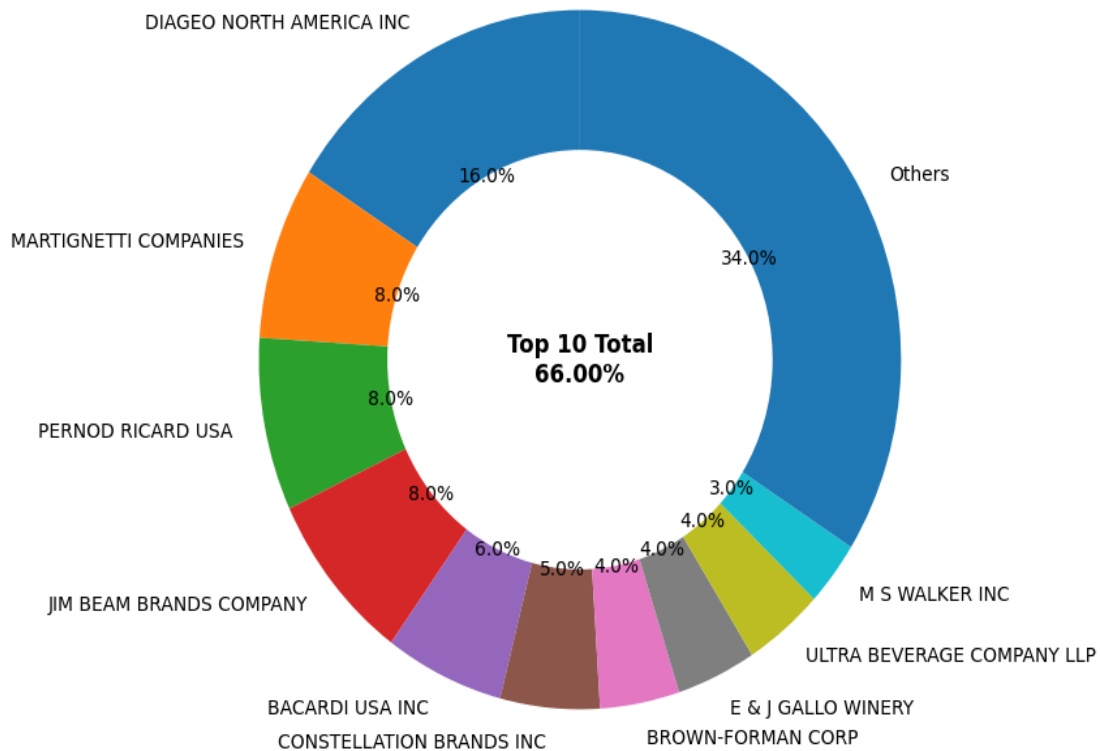
A total of **198 brands** demonstrate **lower sales volumes but relatively higher profit margins**. These brands could benefit from **targeted marketing efforts, promotional activities, or strategic price adjustments** aimed at increasing sales volume without compromising overall profitability.

	Description	TotalSalesDollars	ProfitMargin
6199	Santa Rita Organic Svgn Bl	9.99	66.466466
2369	Debauchery Pnt Nr	11.58	65.975820
2070	Concannon Glen Ellen Wh Zin	15.95	83.448276
2188	Crown Royal Apple	27.86	89.806174
6237	Sauza Sprklg Wild Berry Marg	27.96	82.153076
...
5074	Nanbu Bijin Southern Beauty	535.68	76.747312
2271	Dad's Hat Rye Whiskey	538.89	81.851584
57	A Bichot Clos Marechaudes	539.94	67.740860
6245	Sbragia Home Ranch Merlot	549.75	66.444748
3326	Goulee Cos d'Estournal 10	558.87	69.434752

2. Top Vendors by Sales & Purchase Contribution

The **top 10 vendors** account for **65.69% of total purchases**, while the remaining vendors together contribute only **34.31%**. This heavy dependence on a small group of vendors increases the risk of **supply chain disruptions** and highlights the importance of **diversifying vendor sources** to reduce dependency.

Top 10 Vendors — Purchase Contribution (%)



3. Impact of Bulk Purchasing on Cost Savings

Vendors purchasing in larger quantities benefit from a **72% reduction in unit cost (\$10.78 per unit** compared to significantly higher costs for smaller orders).

Bulk pricing strategies play a key role in driving vendors toward **larger order sizes**, which helps increase overall sales volumes while still ensuring profitability.

Order Size vs. Unit Purchase Price

- Small: 39.06
- Medium: 15.49
- Large: 10.78

	VendorName	UnsoldinventoryValue
25	DIAGEO NORTH AMERICA INC	722.209050K
46	JIM BEAM BRANDS COMPANY	554.665630K
68	PERNOD RICARD USA	470.625610K
116	WILLIAM GRANT & SONS INC	401.960830K
30	E & J GALLO WINERY	228.282610K
79	SAZERAC CO INC	198.436410K
11	BROWN-FORMAN CORP	177.733740K
20	CONSTELLATION BRANDS INC	133.617620K
61	MOET HENNESSY USA INC	126.477700K
77	REMY COINTREAU USA INC	118.598150K

4. Identifying Vendors with Low Inventory Turnover

- **Total Unsold Inventory Capital:** \$2.71M
- Slow-moving inventory leads to **higher storage expenses**, lowers **cash flow efficiency**, and negatively impacts overall **profitability**.
- By identifying vendors with **low inventory turnover**, businesses can improve stock management, reduce financial strain, and optimize working capital utilization.

5. Profit Margin Comparison: High vs. Low-Performing Vendors

- **Top Vendors' Profit Margin (95% CI):** 30.74% – 31.61% | **Mean:** 31.17%
- **Low Vendors' Profit Margin (95% CI):** 40.48% – 42.62% | **Mean:** 41.55%
- Low-performing vendors tend to maintain **higher profit margins** but face challenges in achieving sufficient **sales volumes**, indicating possible **pricing inefficiencies** or **limited market reach**.

Final Recommendation:

- Re-Evaluate the pricing for low sales, high margin to boost sales volume without sacrificing profitability.
- **Vendor Diversification:** Establish a broader base of vendor partnerships to minimize overdependence on a limited number of suppliers and reduce potential supply chain disruptions.
- **Bulk Purchasing Advantage:** Capitalize on bulk procurement opportunities to maintain competitive pricing while simultaneously enhancing inventory management practices.
- **Inventory Optimization:** Address slow-moving inventory by adjusting purchase quantities, launching clearance campaigns, or adopting revised storage policies to improve turnover.
- **Marketing & Distribution Enhancement:** Implement stronger marketing and distribution strategies for low-performing vendors to increase sales volumes without compromising profitability.
- **Sustainable Growth:** By adopting these recommendations, the company can achieve sustainable profitability, effectively mitigate risks, and enhance overall operational efficiency.