**STATISTICAL & BUSINESS INSIGHTS – OPTIMIZATION IN SUPPLY CHAIN MANAGEMENT**

**By using SQL**

**Statistical Insights:**

* Distribution: The data appears skewed, with several states having significantly higher negative QTYs than the average. This signifies potential inefficiencies in their supply chains. Additionally, the presence of dates and customers with exceptionally high QTYs suggests outliers that might represent specific promotions or unusual events.
* Moments and Variability: The mean QTY of around 40 with a high standard deviation of over 200 indicates substantial variability in quantity across states. This underscores the need for flexible strategies to account for varying demand levels.
* Skewness and Kurtosis: The negative values of skewness and kurtosis further confirm the left-skewed distribution and highlight the presence of extreme negative outliers impacting the overall statistics.

**Business Insights:**

* Inefficiencies and Cost Losses: High negative QTYs across specific states are a red flag for inefficiencies in the supply chain, likely leading to excess inventory, wasted resources, and potentially missed sales opportunities. Investigating the factors behind these losses should be a priority.
* Targeting Key Customers and Dates: Dates and customers with consistently high QTYs represent valuable insights. Focusing marketing efforts, special offers, or capacity allocation around these key players could optimize your resource utilization and increase revenue.
* Prioritizing State-Specific Strategies: The varying QTY distribution across states suggests the need for customized strategies tailored to each region's unique characteristics and challenges. Addressing the inefficiencies in states with significant negative QTYs could bring substantial cost savings and operational improvements.

**Additional Recommendations:**

* Reason for Returns: Analyzing the reasons behind returns would provide crucial context for addressing inefficiencies and implementing targeted solutions. Categorizing returns by cause (damage, overstock, customer preference) allows for focused action.
* Quantify Financial Impact: Estimating the cost associated with negative QTYs (lost sales, storage, return processing) will strengthen the case for prioritizing solutions and measuring their effectiveness.