

## Residual Analysis for Labels

The analysis of residual values for label sales provides insights into sales performance against expected outcomes, highlighting periods of both underperformance and overperformance.

### Key Observations:

1. **Residual Fluctuations:** The residual values exhibit significant fluctuations over the observed period, indicating inconsistent sales performance.
  - **Negative Residuals:**
    - **October 2015** (-234.16) and **November 2016** (-374.46) show substantial negative residuals, suggesting a shortfall in actual sales compared to expected values. These months may require closer examination to identify potential causes, such as reduced demand or increased competition.
    - **March 2017** (-197.71) and **February 2018** (-138.67) also indicate negative performance, warranting further investigation into sales strategies and market conditions during these times.
  - **Positive Residuals:**
    - **March 2016** (270.38) and **October 2016** (344.77) demonstrate positive residuals, indicating that actual sales exceeded expectations. These months could provide insights into successful marketing campaigns or product launches that resonated with customers.
    - **November 2017** (325.54) also highlights strong performance, suggesting favorable conditions or effective sales tactics during this period.
2. **Inconsistent Performance:** The presence of both significant positive and negative residuals across months illustrates volatility in label sales. For instance, the transition from **September 2016** (-70.61) to **October 2016** (344.77) showcases a sharp reversal, indicating potential changes in customer preferences or seasonal impacts.

### Actionable Insights:

1. **Investigate Key Months:** The months with significant negative residuals should be analyzed to determine the underlying causes of poor sales performance. This could

include exploring changes in consumer behavior, market trends, or external factors impacting sales.

2. **Leverage Successful Strategies:** Analyzing the months with positive residuals can provide insights into effective sales strategies. Understanding what worked during these periods could inform future marketing and sales approaches.
3. **Continuous Monitoring:** Regularly tracking residual values will aid in identifying emerging trends and enabling swift adjustments to sales strategies.
4. **Cross-Category Comparisons:** Comparing label residuals with other product categories can help identify broader market trends and facilitate more informed decisions regarding inventory and marketing strategies.

### **Next Steps**

- Conduct a detailed review of the months with notable deviations to identify actionable insights that can improve future sales performance.
- Evaluate the effectiveness of sales strategies during periods of high performance and explore how those strategies can be replicated or adapted for future campaigns.