Market Basket Insights

AI Phase 4 Document

Association Analysis

Apriori Algorithm:

- The Apriori algorithm was employed to discover frequent itemsets.
- Parameters such as minimum support (0.01 or 1%) were set to control rule generation.

Association Rules:

- Association rules, consisting of items frequently purchased together, were generated using the Apriori algorithm.
- Rules were filtered based on confidence (minimum threshold of 0.5), indicating the probability of purchasing one item given another.

Analysis Results

Frequent Itemsets:

- Frequent itemsets were calculated, revealing patterns of products frequently bought together.

Association Rules:

- Association rules were generated, indicating strong relationships between products in customer transactions.
- Rules were sorted by confidence and lift, presenting the most significant associations.

Visualization

Support Bar Plot:

- A bar plot was created to display the support (frequency of occurrence) of association rules.
- The x-axis represents association rules, and the y-axis represents support.

Cumulative Support Plot:

- A cumulative distribution function (CDF) plot displayed the cumulative support of rules.
- This plot helps identify a subset of rules with the highest support.

Scatter Plot - Confidence vs. Support:

- A scatter plot illustrated the relationship between confidence and support in association rules.
- It aids in understanding the strength and reliability of associations.

Conclusion

Market Basket Analysis is a powerful technique for retailers to uncover valuable insights into customer purchasing behavior. The analysis provided insights into which products are frequently bought together and led to the generation of actionable recommendations for cross-selling. Visualizations help stakeholders grasp the significance of different association rules.

Future steps may involve implementing automated recommendations based on these rules and continuously refining the analysis to adapt to evolving customer behavior and preferences.