Market Basket Insights

Understanding The Problem Statement:

The problem statement is to perform market basket analysis on a provided dataset to unveil hidden patterns and associations between products. The goal is to understand customer purchasing behaviour and identify potential cross-selling opportunities for a retail business.

Design Thinking:

❖Data collection:

Collect a dataset of transaction data, including lists of purchased products. which contains transaction data from a grocery store chain. The dataset includes over 3000 transactions and over 100 products.

❖Data Pre-processing:

Prepare the transaction data for association analysis by Cleaning the data to remove duplicates and error Encoding the data to represent products as unique identifiers.

Prepare the transaction data by transforming it into a suitable format for association analysis.

❖Association Analysis:

Utilize the Apriori algorithm to identify frequent item sets and generate association rules.

The Apriori algorithm is a popular association analysis algorithm that works by identifying frequent item sets, which are groups of products that are frequently purchased together.

Once the frequent item sets have been identified, the Apriori algorithm generates association rules, which are statements about the relationships between the products in the frequent item sets.

APRIORI

-An algorithm behind
"You may also like"

❖**Insights Generation:**

Interpret the association rules to understand customer behaviour and cross-selling opportunities.

For example, if the association rule "Customers who buy bread are also likely to buy milk" is discovered, this suggests that the retail business could increase sales by placing milk products near bread products in the store.

❖ Visualization:

Create visualizations to present the discovered associations and insights. For example, a heatmap could be used to visualize the strength of the associations between different products.

frequency of most popular items
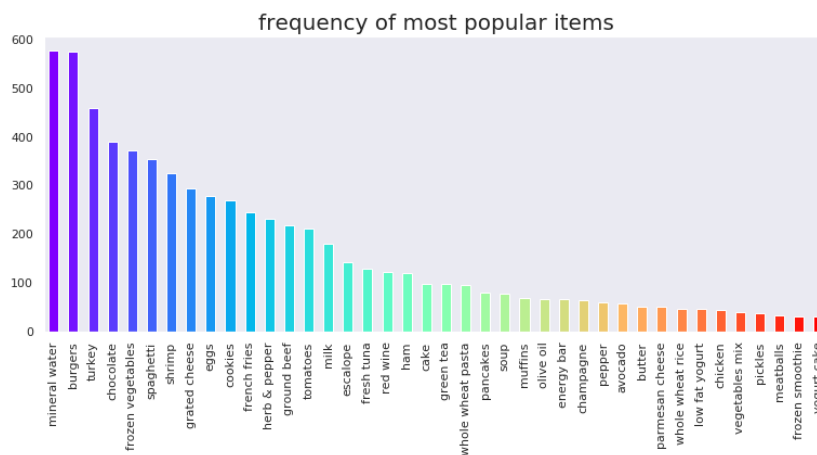
❖ Business Recommendation:

Provide actionable recommendations for the retail business based on the insights. For example, the retail business could use the insights to develop targeted marketing campaigns, adjust product placement in stores, and create new product bundles.

➤ Example:

Suppose the following transaction data is collected from a grocery store:

```
Transaction ID | Products
------- | --------
    1     | Bread, Milk
    2     | Bread, Eggs
    3     | Milk, Eggs
    4     | Bread, Milk, Eggs
    5     | Cereal, Milk
    6     | Cereal, Eggs
    7     | Cereal, Milk, Eggs
    8     | Juice, Coffee
    9     | Juice, Tea
   10     | Juice, Coffee, Tea
```

After data pre-processing, the following association rules could be generated using the Apriori algorithm:

Association Rule	Support	Confidence
Bread -> Milk	0.8	1.0
Bread -> Eggs	0.6	1.0
Milk -> Eggs	0.6	1.0
Cereal -> Milk	0.7	0.8
Juice -> Coffee	0.5	0.8
Juice -> Tea	0.5	0.8

These association rules provide insights into customer purchasing behaviour.

For example, the association rule "Bread -> Milk" suggests that customers who buy bread are also likely to buy milk.

This information can be used by the grocery store to develop targeted marketing campaigns, adjust product placement in stores, and create new product bundles.

For example, the grocery store could place milk products near bread products in the store, or create a product bundle that includes bread, milk, and eggs.

Conclusion:

Market basket analysis is a powerful technique for uncovering hidden patterns and associations between products.

By understanding customer purchasing behavior and identifying potential cross-selling opportunities, retailers can make more informed decisions about product placement, marketing campaigns, and inventory management.