

**Project Title:** Market Basket Analysis in Telecom: Predicting Customer Purchasing Behaviors

**Introduction:** Market Basket Analysis is a powerful modeling technique used in the telecom sector to understand customer purchasing behaviors. It is based on the theory that certain groups of items are more likely to be bought together. For example, customers who buy a pint of beer without a bar meal are more likely to purchase crisps. By analyzing customer itemsets, we can identify relationships between purchases and predict what customers might buy next based on their current purchases.

**Objective:** The objective of this project is to perform Market Basket Analysis using the Apriori Algorithm on telecom customer transaction data. By discovering associations between different products, telecom providers can strategically improve customer retention and optimize sales.

### **Project Scope: 1. Data Collection:**

- Gather transactional data containing customer purchases, including product codes and timestamps.

### **2. Data Preprocessing:**

- Cleanse and preprocess the data to remove duplicates and handle missing values.

### **3. Market Basket Analysis:**

- Implement the Apriori Algorithm to identify frequent itemsets and generate association rules.

### **4. Rule Evaluation:**

- Calculate the support and confidence of association rules to assess their significance.

### ***5. Location and Promotion Optimization:***

- Use the analysis results to decide the location and promotion of products inside telecom stores.
- Place high-margin products near frequently purchased items to increase customer temptations.

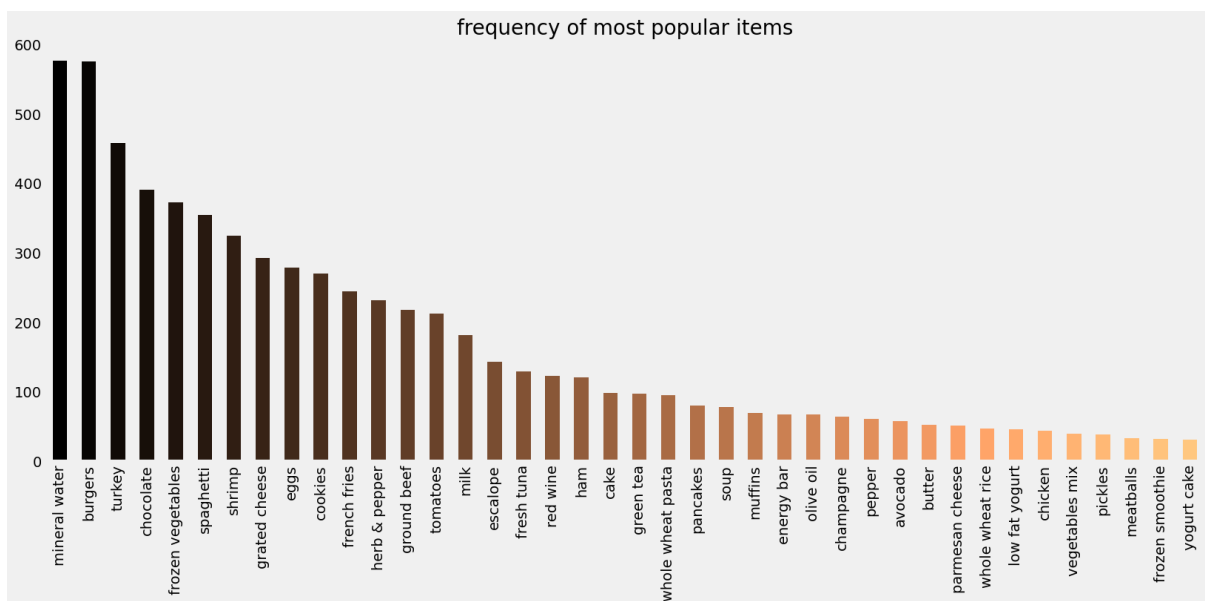
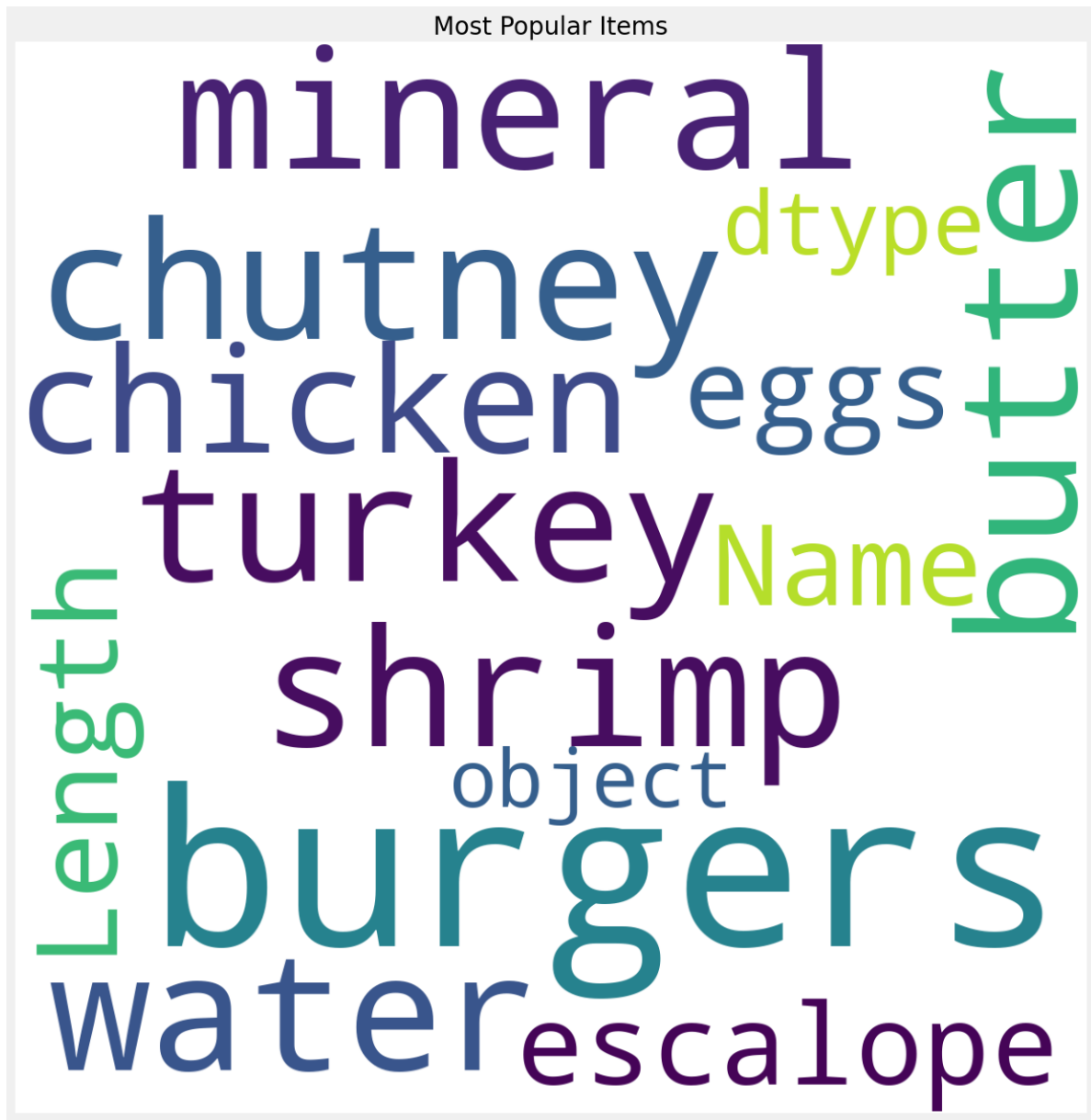
### ***6. Differential Analysis:***

- Compare results between different stores, customer demographic groups, and time periods to identify unique patterns.
- Investigate differences to gain insights into customer preferences and optimize sales strategies.

### ***7. Visualization and Reporting:***

- Present the findings using charts, graphs, and reports for better comprehension and decision-making.

### **Visuals:**



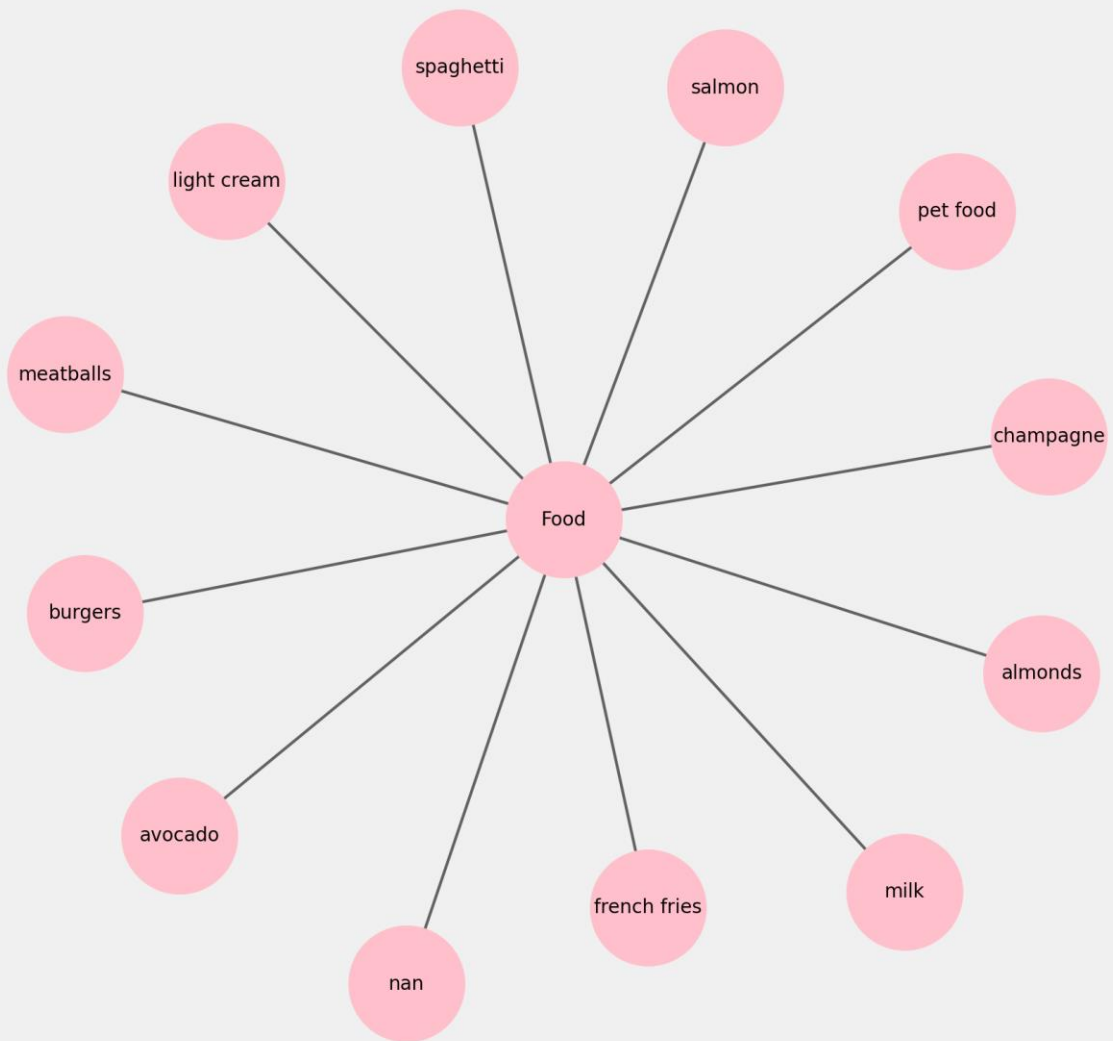
Tree Map for Popular Items

Main Category	Sub-Category	Item
chocolate	tomatoes	whole wheat pasta
		pepper
		whole wheat rice
		dessert wine
	ground beef	salmon
		cereals
		yams
	ham	oil
		parmesan cheese
		chocolate
turkey	tomatoes	whole wheat pasta
		pepper
		whole wheat rice
		dessert wine
	ground beef	salmon
		cereals
		yams
	ham	oil
		parmesan cheese
		chocolate
burgers	tomatoes	whole wheat pasta
		pepper
		whole wheat rice
		dessert wine
	ground beef	salmon
		cereals
		yams
	ham	oil
		parmesan cheese
		chocolate
mineral water	tomatoes	whole wheat pasta
		pepper
		whole wheat rice
		dessert wine
	ground beef	salmon
		cereals
		yams
	ham	oil
		parmesan cheese
		chocolate

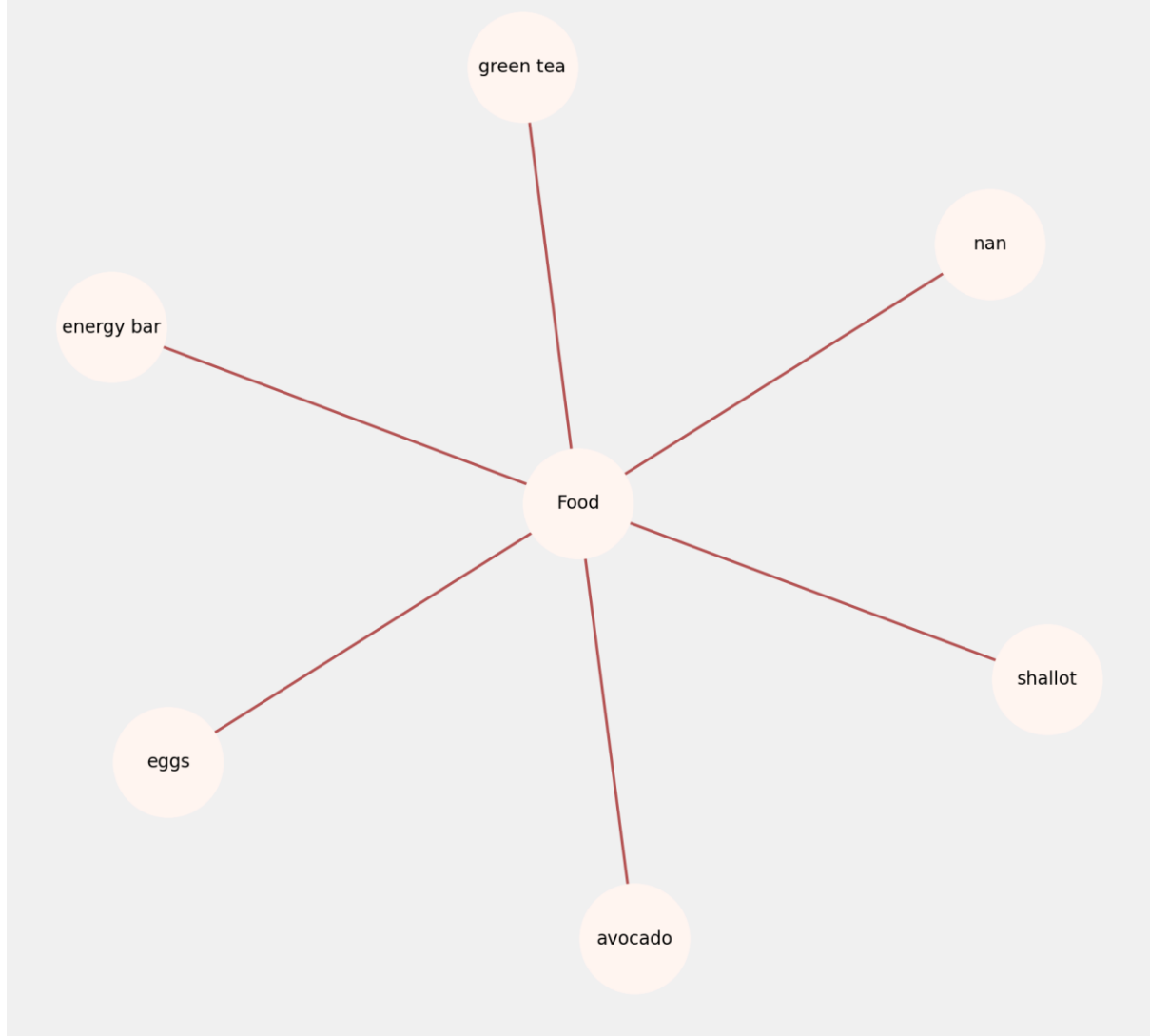
## Top 15 First Choices



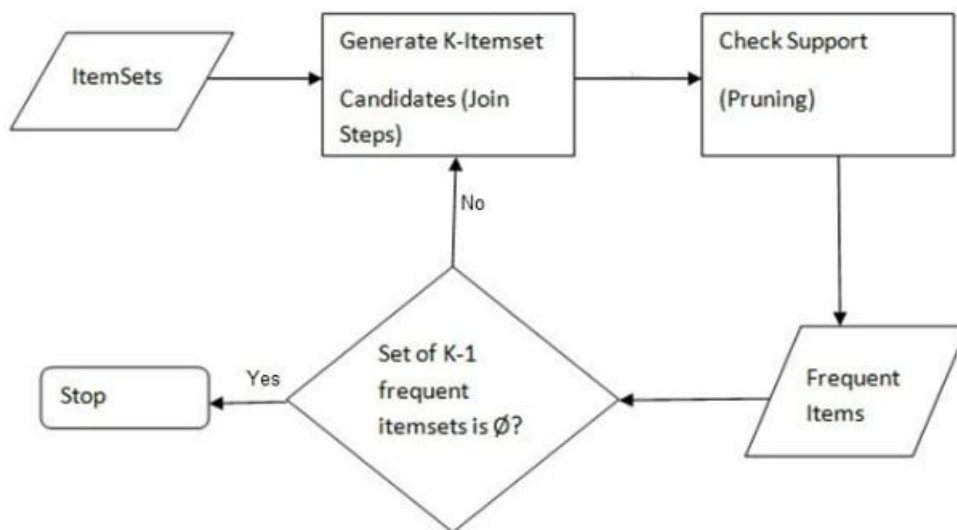
## Top 15 Second Choices



## Top 10 Third Choices



### Flow Chart:



**Other Application Areas:** Apart from telecom, Market Basket Analysis can be applied in various domains, such as:

- Analyzing credit card purchases to identify spending patterns.
- Studying telephone calling patterns for optimizing service plans.
- Detecting fraudulent medical insurance claims based on irregular purchase patterns.
- Analyzing telecom service purchases to improve service offerings.

**Conclusion:** Market Basket Analysis provides telecom providers with valuable insights into customer purchasing behaviors. By leveraging association rules and differential analysis, telecom companies can optimize product placements, improve customer experiences, and ultimately reduce churn rates. The predictive capabilities of this analysis can lead to better customer retention strategies and enhanced business performance.