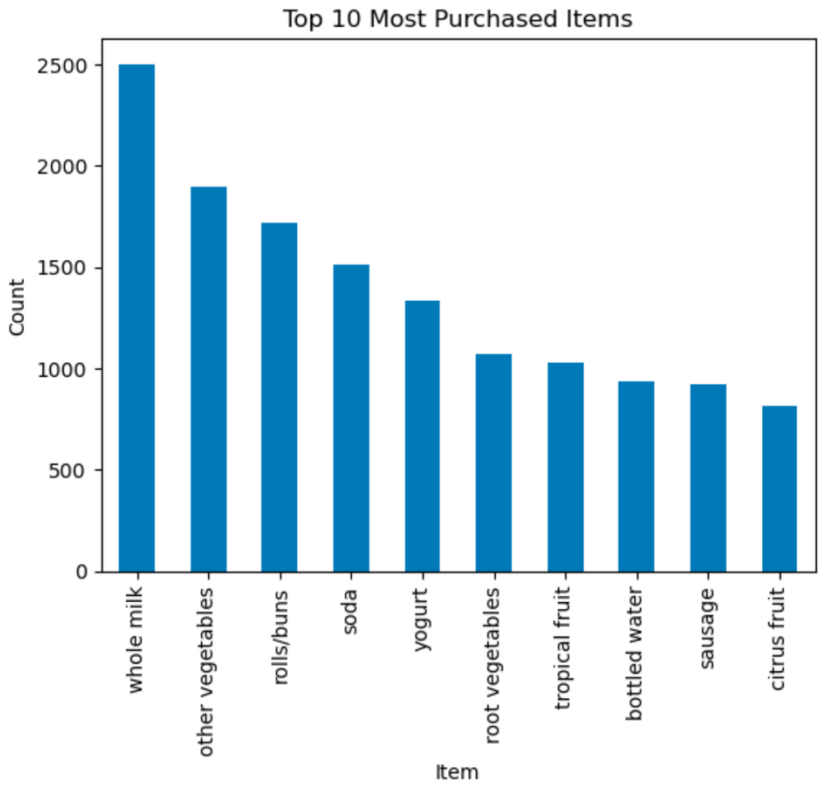
The **goal** of this analysis was to explore frequent associations among purchases at a grocery store using the mlxtend library in Python.

The data file contained 38,765 rows of data with member number, the date, and the description if the item.

Key steps taken:

1. Data Preparation:
    a. Transactions were grouped by the customer and date to create a "basket".
    b. Data was transformed into a one-hot encoded format to be suitable for association rule mining.
2. Frequent Item Sets:
    a. The Apriori algorithm identified 126 frequent items with a minimum support of 0.5%.
    b. The most commonly purchased items included whole milk, other vegetables, and rolls/buns.



3. Association Rules:
    a. Rules were generated with the metrics support (.005), confidence (> 10%), and lift (>1.2), which generated 39 meaningful association rules.

Summary of Findings:

- The majority of rules had lift of less than 1 (Figure 1), indicating that these items co-occurred less frequently than expected by chance.
- The rule of frankfurter → other vegetables had a lift of 1.12, indicating that the purchase of frankfurters increased the chance of purchasing other vegetables.
- The majority of rules had whole milk in the association (see Figure 1).

Figure 1.

Heatmap Showing Rules and Lift.

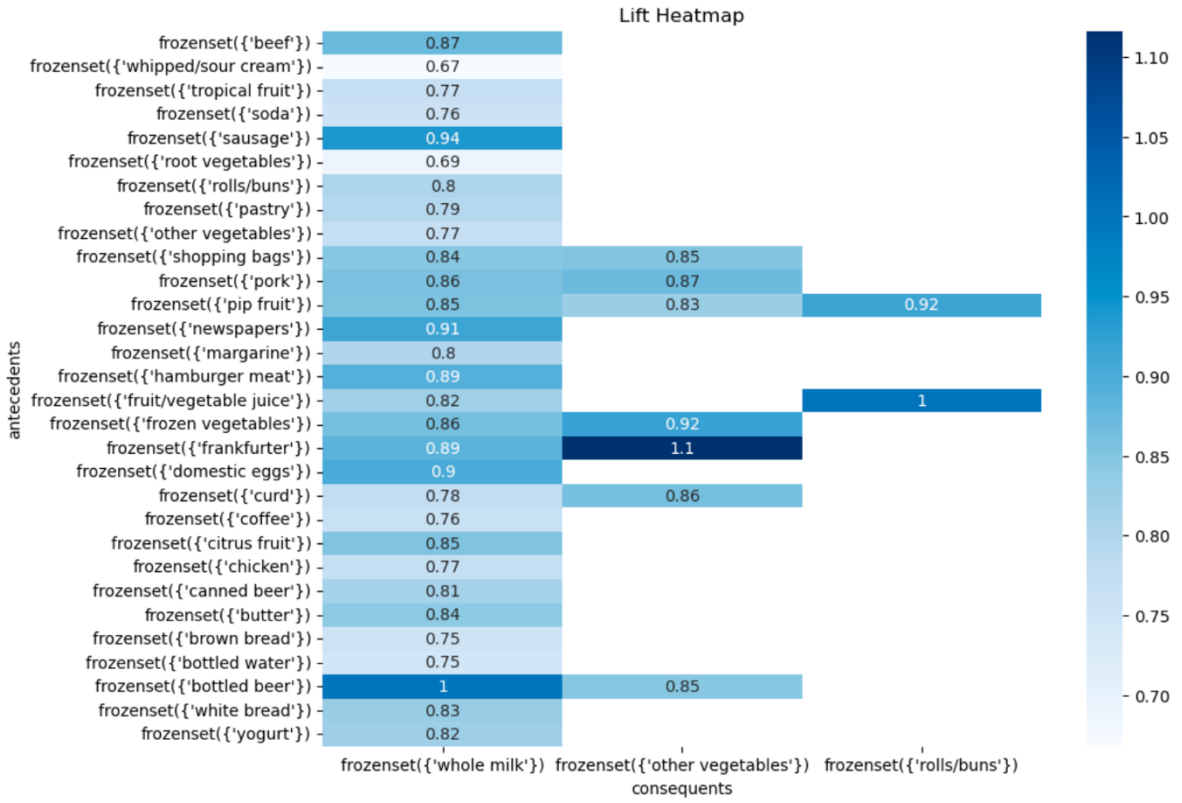


Figure 2.

Association Rule Network.