**Association Rule Mining**

Association rule mining is a machine learning technique used to discover interesting relationships or associations between items in a large dataset.

It is often used in market basket analysis to identify items that are frequently purchased together.

The basic idea behind association rule mining is to identify rules of the form "if A then B" or "if A and B then C".

An example of an association rule could be "if a customer buys bread and eggs, they are likely to also buy milk".

You need to identify or assume:

1. antecedent or left-hand side of the rule “if a customer buys bread and eggs”
2. right-hand side of the rule “They are likely to also buy milk.”

The most commonly used algorithm for association rule mining is the Apriori algorithm, which uses a bottom-up approach to generate all possible itemsets and then prune them based on their support and confidence levels. The support of an itemset is the proportion of transactions in the dataset that contain all the items in the set, while the confidence of a rule is the proportion of transactions containing the antecedent that also contain the consequent.

from mlxtend.frequent\_patterns import apriori

from mlxtend.frequent\_patterns import association\_rules

# Load the dataset

dataset = [['bread', 'milk', 'eggs'],

['bread', 'milk'],

['milk', 'eggs'],

['bread', 'butter'],

['butter', 'jam']]

# Generate frequent itemsets with a minimum support of 0.5

frequent\_itemsets = apriori(dataset, min\_support=0.5, use\_colnames=True)

# Generate association rules with a minimum confidence of 0.8

association\_rules = association\_rules(frequent\_itemsets, metric="confidence", min\_threshold=0.8)

# Print the rules

print(association\_rules)