

# MSBA 511: Data Mining for Business Analytics

## Conceptual Homework 1: Association Rules

### Objective

#### Be able to:

- Apply the steps of the Apriori algorithm to find frequent itemsets and valid association rules based on defined thresholds.

### Overview

In this assignment, you will analyze transaction data to generate association rules using the Apriori algorithm. Your goal is to identify patterns in the data with a **minimum support of 30%** and a **minimum confidence of 50%**.

### Data

The dataset includes transaction IDs and items purchased together:

tran_id	items
1	bread, butter, soap
2	milk, butter
3	peas, milk, soap
4	bread, peas, butter, soap
5	bread, peas, milk, soap
6	bread, butter, soap
7	peas, butter, soap
8	bread, peas, milk
9	bread, milk, butter, soap
10	bread, peas, soap

## Tasks

1. For the minimum support threshold, identify all frequent itemsets.
2. Based on the identified frequent itemsets, identify all valid association rules based on the minimum confidence threshold.

## Submission Requirements

Submit a PDF document to Gradescope that includes the following:

1. A table of frequent itemsets with support values.
2. A table of association rules with:
  - a. Antecedent
  - b. Consequent
  - c. Support
  - d. Confidence
  - e. Lift
3. Detailed analysis steps for each step. You may include screenshots or graphics in addition to a textual summary.
4. Interpret the results in a business context.
  - a. For each rule, explain what it means in the context of this data and highlight any interesting or actionable insights you observe.