

Association:

- 1) Trace the results of using the Apriori algorithm on the grocery store example with support threshold $s=2$

Transaction ID	Items
T1	HotDogs, Buns, Ketchup
T2	HotDogs, Buns
T3	HotDogs, Coke, Chips
T4	Chips, Coke
T5	Chips, Ketchup
T6	HotDogs, Coke, Chips

- 2) Giving the following database with 5 transactions and a minimum support threshold of 60%

TID	Transaction
T1	{A, B, C, D, E, F}
T2	{B, C, D, E, F, G}
T3	{A, D, E, H}
T4	{A, D, F, I, J}
T5	{B, D, E, K}

Project

Assignment: Market Basket Analysis Using Association Rules

Dataset: `Egyptian_Grocery_Transactions.xlsx`

This dataset contains **grocery transactions** from a typical Egyptian supermarket. Each transaction lists the items purchased together (e.g., **فول, طعمية**, **ش بلدي**). The dataset includes frequent local products and commonly co-purchased item combinations.

Objective:

Apply **market basket analysis** techniques to discover meaningful patterns and associations between items.

Tasks:

1. **Load and preprocess** the dataset.
 - Split items into lists.
 - Use `TransactionEncoder` for one-hot encoding.
 2. **Generate frequent itemsets** using the **Apriori algorithm**:
 - Set `min_support = 0.1`.
 - Sort itemsets by support.
 3. **Generate association rules**:
 - Use `metric='confidence', min_threshold=0.3`.
 - Analyze rules based on **confidence** and **lift**.
 - Identify at least **2 strong rules** and **2 weak rules**, and explain why.
 4. **(Optional Bonus)**: Visualize top rules using bar charts or network graphs.
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Deliverables:

- A clean and commented **Jupyter Notebook** (`.ipynb`)
- A brief summary of **key insights** at the end of your notebook