## **Case-1 : AR : Fruits Preference**

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| Problem Statement | The dataset in a list form contains preference of purchases of Fruits. Use Association Rule Analysis to find Frequent Items Sets and items with interesting rules |
| Objectives | Perform Association Rule |
| Research Qs | Does Support, Confidence, Lift show the interestingness of the purchase |
| Tasks | Convert the data from List to Transaction format  Find Frequent Items Sets. Which are the top 2 items sets  Use association rules to find rules with different metrics.  Support (.3), Confidence(.6) and Lift(1.5)  Also perform filter of rules with combination support, confidence, lift  What marketing strategy will you apply on the interesting rules you have found |

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| **DataSet** |
| [['Apple', 'Beer', 'Rice', 'Chicken'],  ['Apple', 'Beer', 'Rice'],  ['Apple', 'Beer'],  ['Apple', 'Bananas'],  ['Milk', 'Beer', 'Rice', 'Chicken'],  ['Milk', 'Beer', 'Rice'],  ['Milk', 'Beer'],  ['Apple', 'Bananas']] |

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| **Python** |
| import numpy as np  import pandas as pd  import matplotlib.pyplot as plt  from mlxtend.preprocessing import TransactionEncoder  from mlxtend.frequent\_patterns import apriori  from mlxtend.frequent\_patterns import association\_rules  import time  import logging  pd.set\_option('display.max\_columns',None)  dataset = [['Apple', 'Beer', 'Rice', 'Chicken'], ['Apple', 'Beer', 'Rice'], ['Apple', 'Beer'], ['Apple', 'Bananas'], ['Milk', 'Beer', 'Rice', 'Chicken'], ['Milk', 'Beer', 'Rice'], ['Milk', 'Beer'], ['Apple', 'Bananas']]  dataset  te = TransactionEncoder()  te\_ary = te.fit(dataset).transform(dataset)  te\_ary  df = pd.DataFrame(te\_ary, columns=te.columns\_)  df  #%%% #frequent itemsets  support\_threshold = ??  frequent\_itemsets = apriori(df, min\_support= support\_threshold, use\_colnames = True)  #%%%% - Support Rules  supportRules1 = association\_rules(frequent\_itemsets, metric="support", min\_threshold = ??)  print(supportRules1)  print(supportRules1[['antecedents', 'consequents', 'support','confidence','lift']])  #%%%% Lift : generally > 1 for strong associations  lift1 = association\_rules(frequent\_itemsets, metric="lift", min\_threshold=???)  print(lift1)  lift1  print(lift1[['antecedents', 'consequents', 'support', 'lift','confidence']])  #twin condition : lift> 2; confidence > .5, support > .2  lift1[(lift1.confidence > ?? & (lift1.support > ??)]  #%%%% Confidence  confidence1 = association\_rules(frequent\_itemsets, metric="confidence", min\_threshold=>>)  print(confidence1)  print(confidence1[['antecedents', 'consequents', 'support','confidence']]) |