

Artificial Intelligence and Machine Learning

LAB 3

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3. For a dataset, apply Apriori algorithm and identify the best rules based on support and confidence.

Program:

Apriori algorithm

```
import pandas as pd
from mlxtend.frequent_patterns import apriori, association_rules
from mlxtend.preprocessing import TransactionEncoder

transactions = [
    ['Apples', 'Bananas', 'Grapes'],
    ['Apples', 'Oranges', 'Milk'],
    ['Bananas', 'Oranges', 'Yogurt'],
    ['Apples', 'Grapes', 'Yogurt', 'Milk'],
    ['Bananas', 'Oranges', 'Milk', 'Butter'],
    ['Apples', 'Butter', 'Yogurt'],
    ['Bananas', 'Grapes', 'Butter'],
    ['Apples', 'Bananas', 'Oranges', 'Milk'],
    ['Oranges', 'Yogurt', 'Butter'],
    ['Apples', 'Grapes', 'Milk', 'Butter']
]
te = TransactionEncoder()
te_ary = te.fit_transform(transactions)
df = pd.DataFrame(te_ary, columns=te.columns_)
frequent_itemsets = apriori(df, min_support=0.3, use_colnames=True)
rules = association_rules(frequent_itemsets, metric="confidence", min_threshold=0.6)
print(rules[['antecedents', 'consequents', 'support', 'confidence', 'lift']])
```

Output:

| | antecedents | consequents | support | confidence | lift |
|---|-------------|-------------|---------|------------|----------|
| 0 | (Grapes) | (Apples) | 0.3 | 0.750000 | 1.250000 |
| 1 | (Apples) | (Milk) | 0.4 | 0.666667 | 1.333333 |
| 2 | (Milk) | (Apples) | 0.4 | 0.800000 | 1.333333 |
| 3 | (Bananas) | (Oranges) | 0.3 | 0.600000 | 1.200000 |
| 4 | (Oranges) | (Bananas) | 0.3 | 0.600000 | 1.200000 |
| 5 | (Oranges) | (Milk) | 0.3 | 0.600000 | 1.200000 |
| 6 | (Milk) | (Oranges) | 0.3 | 0.600000 | 1.200000 |