

```
!pip install mlxtend
```

```
Requirement already satisfied: mlxtend in /usr/local/lib/python3.11/dist-packages (0.23.4)
Requirement already satisfied: scipy>=1.2.1 in /usr/local/lib/python3.11/dist-packages (from mlxtend) (1.16.1)
Requirement already satisfied: numpy>=1.16.2 in /usr/local/lib/python3.11/dist-packages (from mlxtend) (2.0.2)
Requirement already satisfied: pandas>=0.24.2 in /usr/local/lib/python3.11/dist-packages (from mlxtend) (2.2.2)
Requirement already satisfied: scikit-learn>=1.3.1 in /usr/local/lib/python3.11/dist-packages (from mlxtend) (1.6.1)
Requirement already satisfied: matplotlib>=3.0.0 in /usr/local/lib/python3.11/dist-packages (from mlxtend) (3.10.0)
Requirement already satisfied: joblib>=0.13.2 in /usr/local/lib/python3.11/dist-packages (from mlxtend) (1.5.1)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.0.0->mlxtend) (1.3.0)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.0.0->mlxtend) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.0.0->mlxtend) (4.53.1)
Requirement already satisfied: kiwisolver>=1.3.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.0.0->mlxtend) (1.4.7)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.0.0->mlxtend) (24.1)
Requirement already satisfied: pillow>=8 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.0.0->mlxtend) (10.4.0)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.0.0->mlxtend) (3.1.4)
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.0.0->mlxtend) (2.9.0)
Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.11/dist-packages (from pandas>=0.24.2->mlxtend) (2023.3)
Requirement already satisfied: tzdata>=2022.7 in /usr/local/lib/python3.11/dist-packages (from pandas>=0.24.2->mlxtend) (2024.2)
Requirement already satisfied: threadpoolctl>=3.1.0 in /usr/local/lib/python3.11/dist-packages (from scikit-learn>=1.3->mlxtend) (3.5.0)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.11/dist-packages (from python-dateutil>=2.7->matplotlib) (1.17.0)
```

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

```
df = pd.read_csv('Market_Basket_Data.csv')
print(df.head())
print(df.shape)
print(df.describe())
```

```
Transaction      Items
0                1    Milk,Bread
1                2    Milk,Diaper,Bread,Beer
2                3    Milk,Diaper,Bread,Coke
3                4    Bread,Milk,Diaper,Beer
4                5    Bread,Milk,Diaper,Coke
(5, 2)
Transaction
count    5.000000
mean     3.000000
std      1.581139
min      1.000000
25%      2.000000
50%      3.000000
75%      4.000000
max      5.000000
```

```
transactions = df['Items'].apply(lambda x: x.split(','))
```

```
te = TransactionEncoder()
te_array = te.fit(transactions).transform(transactions)
```

```
df_encoded = pd.DataFrame(te_array, columns=te.columns_)
print(df_encoded)
```

```
Beer  Bread  Coke  Diaper  Milk
0  False   True  False   False   True
1   True   True  False   True   True
2  False   True   True   True   True
3   True   True  False   True   True
4  False   True   True   True   True
```

```
frequent_itemsets = apriori(df_encoded, min_support=0.6, use_colnames=True)
print(frequent_itemsets)
```

```
support  itemsets
0        1.0    (Bread)
1        0.8    (Diaper)
2        1.0    (Milk)
3        0.8    (Diaper, Bread)
4        1.0    (Milk, Bread)
5        0.8    (Diaper, Milk)
```

6 0.8 (Diaper, Milk, Bread)

```
rules = association_rules(frequent_itemsets, metric="lift", min_threshold=1.0)
print(rules[['antecedents', 'consequents', 'support', 'confidence', 'lift']])
```

```
↔
antecedents      consequents  support  confidence  lift
0      (Diaper)      (Bread)    0.8        1.0    1.0
1      (Bread)      (Diaper)    0.8        0.8    1.0
2      (Milk)       (Bread)    1.0        1.0    1.0
3      (Bread)      (Milk)     1.0        1.0    1.0
4      (Diaper)      (Milk)     0.8        1.0    1.0
5      (Milk)       (Diaper)    0.8        0.8    1.0
6  (Diaper, Milk)    (Bread)    0.8        1.0    1.0
7  (Diaper, Bread)   (Milk)     0.8        1.0    1.0
8  (Milk, Bread)     (Diaper)    0.8        0.8    1.0
9  (Diaper)          (Milk, Bread) 0.8        1.0    1.0
10 (Milk)            (Diaper, Bread) 0.8        0.8    1.0
11 (Bread)          (Diaper, Milk) 0.8        0.8    1.0
/usr/local/lib/python3.11/dist-packages/mlxtend/frequent_patterns/association_rules.py:186: RuntimeWarning: invalid va
cert_metric = np.where(certainty_denom == 0, 0, certainty_num / certainty_denom)
```