```
pip install mlxtend
```

```
Collecting mlxtend
  Downloading mlxtend-0.23.4-py3-none-any.whl.metadata (7.3 kB)
Requirement already satisfied: scipy>=1.2.1 in c:\users\sit.lab7\appdata\local\anaconda3\lib\site-packages (from mlxtend) (1.13.1)
Requirement already satisfied: numpy>=1.16.2 in c:\users\sit.lab7\appdata\local\anaconda3\lib\site-packages (from mlxtend) (1.26.4)
Requirement already satisfied: pandas>=0.24.2 in c:\users\sit.lab7\appdata\local\anaconda3\lib\site-packages (from mlxtend) (2.2.2)
Requirement already satisfied: scikit-learn>=1.3.1 in c:\users\sit.lab7\appdata\local\anaconda3\lib\site-packages (from mlxtend) (1
Requirement already satisfied: matplotlib>=3.0.0 in c:\users\sit.lab7\appdata\local\anaconda3\lib\site-packages (from mlxtend) (3.9
Requirement already satisfied: joblib>=0.13.2 in c:\users\sit.lab7\appdata\local\anaconda3\lib\site-packages (from mlxtend) (1.4.2)
Requirement already satisfied: contourpy>=1.0.1 in c:\users\sit.lab7\appdata\local\anaconda3\lib\site-packages (from matplotlib>=3.
Requirement already satisfied: cycler>=0.10 in c:\users\sit.lab7\appdata\local\anaconda3\lib\site-packages (from matplotlib>=3.0.0-
Requirement already satisfied: fonttools>=4.22.0 in c:\users\sit.lab7\appdata\local\anaconda3\lib\site-packages (from matplotlib>=3
Requirement already satisfied: kiwisolver>=1.3.1 in c:\users\sit.lab7\appdata\local\anaconda3\lib\site-packages (from matplotlib>=3
Requirement already satisfied: packaging>=20.0 in c:\users\sit.lab7\appdata\local\anaconda3\lib\site-packages (from matplotlib>=3.0
Requirement already satisfied: pillow>=8 in c:\users\sit.lab7\appdata\local\anaconda3\lib\site-packages (from matplotlib>=3.0.0->ml
Requirement already satisfied: pyparsing>=2.3.1 in c:\users\sit.lab7\appdata\local\anaconda3\lib\site-packages (from matplotlib>=3.
Requirement already satisfied: python-dateutil>=2.7 in c:\users\sit.lab7\appdata\local\anaconda3\lib\site-packages (from matplotlib
Requirement already satisfied: pytz>=2020.1 in c:\users\sit.lab7\appdata\local\anaconda3\lib\site-packages (from pandas>=0.24.2->ml
Requirement already satisfied: tzdata>=2022.7 in c:\users\sit.lab7\appdata\local\anaconda3\lib\site-packages (from pandas>=0.24.2->
Requirement already satisfied: threadpoolctl>=3.1.0 in c:\users\sit.lab7\appdata\local\anaconda3\lib\site-packages (from scikit-lea
Requirement already satisfied: six>=1.5 in c:\users\sit.lab7\appdata\local\anaconda3\lib\site-packages (from python-dateutil>=2.7->
Downloading mlxtend-0.23.4-py3-none-any.whl (1.4 MB)
   ---------------------------------------- 0.0/1.4 MB ? eta -:--:--
   ---------------------------------------- 1.4/1.4 MB 23.2 MB/s eta 0:00:00
Installing collected packages: mlxtend
Successfully installed mlxtend-0.23.4
Note: you may need to restart the kernel to use updated packages.
```

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

```
dataset = [
    ['milk', 'bread', 'nuts', 'apple'],
    ['milk', 'bread', 'nuts'],
    ['milk', 'bread',],
    ['milk', 'apple'],
    ['milk', 'bread', 'apple'],
    ['milk', 'bread', 'apple'],
    ['bread', 'nuts']
]
```

```
from mlxtend.preprocessing import TransactionEncoder
te =  TransactionEncoder()
te_array = te.fit(dataset).transform(dataset)
df = pd.DataFrame(te_array, columns=te.columns_)
```

```
print("One-Hot Encoded Transaction Data:")
print(df)
```

```
One-Hot Encoded Transaction Data:
   apple  bread   milk   nuts
0   True   True   True   True
1  False   True   True   True
2  False   True   True  False
3   True  False   True  False
4   True   True   True  False
5   True   True   True  False
6  False   True  False   True
```

```
frequent_itemsets = apriori(df, min_support=0.3, use_colnames=True)
print("\n Frequent Itemsets:")
print(frequent_itemsets)
```

```
 Frequent Itemsets:
    support              itemsets
0  0.571429               (apple)
1  0.857143               (bread)
2  0.857143                (milk)
3  0.428571                (nuts)
4  0.428571        (apple, bread)
5  0.571429         (apple, milk)
6  0.714286         (milk, bread)
7  0.428571         (nuts, bread)
8  0.428571  (apple, milk, bread)
```

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

```
 Association Rules:
      antecedents     consequents   support      lift  confidence      lift
0         (apple)          (milk)  0.571429  1.166667    1.000000  1.166667
1          (milk)         (apple)  0.571429  1.166667    0.666667  1.166667
2          (nuts)         (bread)  0.428571  1.166667    1.000000  1.166667
3         (bread)          (nuts)  0.428571  1.166667    0.500000  1.166667
4  (apple, bread)          (milk)  0.428571  1.166667    1.000000  1.166667
5   (milk, bread)         (apple)  0.428571  1.050000    0.600000  1.050000
6         (apple)   (milk, bread)  0.428571  1.050000    0.750000  1.050000
7          (milk)  (apple, bread)  0.428571  1.166667    0.500000  1.166667
```

```
ruloe = rules.sort_values(by='lift', ascending=False)
print("\n Top Rules by Lifts:")
print(rules[['antecedents', 'consequents', 'support', 'lift' , 'confidence', 'lift']])
```

```
 Top Rules by Lifts:
      antecedents     consequents   support      lift  confidence      lift
0         (apple)          (milk)  0.571429  1.166667    1.000000  1.166667
1          (milk)         (apple)  0.571429  1.166667    0.666667  1.166667
2          (nuts)         (bread)  0.428571  1.166667    1.000000  1.166667
3         (bread)          (nuts)  0.428571  1.166667    0.500000  1.166667
4  (apple, bread)          (milk)  0.428571  1.166667    1.000000  1.166667
5   (milk, bread)         (apple)  0.428571  1.050000    0.600000  1.050000
6         (apple)   (milk, bread)  0.428571  1.050000    0.750000  1.050000
7          (milk)  (apple, bread)  0.428571  1.166667    0.500000  1.166667
```

```
Start coding or generate with AI.
```