

```
dataset = [['Hotdogs', 'Buns', 'Ketchup'],
           ['Hotdogs', 'Buns'],
           ['Hotdogs', 'Coke', 'Chips'],
           ['Chips', 'Coke'],
           ['Chips', 'Ketchup'],
           ['Hotdogs', 'Coke', 'Chips']]
```

```
print(dataset)
```

```
[['Hotdogs', 'Buns', 'Ketchup'], ['Hotdogs', 'Buns'], ['Hotdogs', 'Coke', 'Chips'], ['Chips', 'Coke'], ['Chips', 'Ketchup'], ['Hotdogs',
```

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

```

Buns  Chips  Coke  Hotdogs  Ketchup
0     True   False  False     True     True
1     True   False  False     True    False
2    False   True   True     True    False
3    False   True   True    False    False
4    False   True   False    False     True
5    False   True   True     True    False
```

```
from mlxtend.frequent_patterns import apriori
frequent_itemsets_ap= apriori(df, min_support=0.01, use_colnames=True)
frequent_itemsets_fp= apriori(df, min_support=0.01, use_colnames=True)
```

```
print(frequent_itemsets_ap)
```

```

support  itemsets
0  0.333333  (Buns)
1  0.666667  (Chips)
2  0.500000  (Coke)
3  0.666667  (Hotdogs)
4  0.333333  (Ketchup)
5  0.333333  (Buns, Hotdogs)
6  0.166667  (Buns, Ketchup)
7  0.500000  (Coke, Chips)
8  0.333333  (Hotdogs, Chips)
9  0.166667  (Chips, Ketchup)
10 0.333333  (Coke, Hotdogs)
11 0.166667  (Hotdogs, Ketchup)
12 0.166667  (Buns, Hotdogs, Ketchup)
13 0.333333  (Coke, Hotdogs, Chips)
```

```
pip install mlxtend --upgrade
```

```
Requirement already satisfied: mlxtend in /usr/local/lib/python3.7/dist-packages (0.19.0)
Requirement already satisfied: scikit-learn>=0.20.3 in /usr/local/lib/python3.7/dist-packages (from mlxtend) (1.0.2)
Requirement already satisfied: numpy>=1.16.2 in /usr/local/lib/python3.7/dist-packages (from mlxtend) (1.21.5)
Requirement already satisfied: joblib>=0.13.2 in /usr/local/lib/python3.7/dist-packages (from mlxtend) (1.1.0)
Requirement already satisfied: setuptools in /usr/local/lib/python3.7/dist-packages (from mlxtend) (57.4.0)
Requirement already satisfied: pandas>=0.24.2 in /usr/local/lib/python3.7/dist-packages (from mlxtend) (1.3.5)
Requirement already satisfied: matplotlib>=3.0.0 in /usr/local/lib/python3.7/dist-packages (from mlxtend) (3.2.2)
Requirement already satisfied: scipy>=1.2.1 in /usr/local/lib/python3.7/dist-packages (from mlxtend) (1.4.1)
Requirement already satisfied: python-dateutil>=2.1 in /usr/local/lib/python3.7/dist-packages (from matplotlib>=3.0.0->mlxtend) (2.8.2)
Requirement already satisfied: pyparsing!=2.0.4,!=2.1.2,!=2.1.6,>=2.0.1 in /usr/local/lib/python3.7/dist-packages (from matplotlib>=3.0.0->mlxtend) (3.0.7)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.7/dist-packages (from matplotlib>=3.0.0->mlxtend) (0.11.0)
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.7/dist-packages (from matplotlib>=3.0.0->mlxtend) (1.3.2)
Requirement already satisfied: pytz>=2017.3 in /usr/local/lib/python3.7/dist-packages (from pandas>=0.24.2->mlxtend) (2018.9)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/dist-packages (from python-dateutil>=2.1->matplotlib>=3.0.0->mlxtend) (1.16.0)
Requirement already satisfied: threadpoolctl>=2.0.0 in /usr/local/lib/python3.7/dist-packages (from scikit-learn>=0.20.3->mlxtend) (3.1.0)
```

```
from mlxtend.frequent_patterns import fpgrowth
frequent_itemsets_fp= fpgrowth(df, min_support=0.01, use_colnames=True)
```

```
print(frequent_itemsets_fp)
```

	support	itemsets
0	0.666667	(Hotdogs)
1	0.333333	(Ketchup)
2	0.333333	(Buns)
3	0.666667	(Chips)
4	0.500000	(Coke)
5	0.166667	(Hotdogs, Ketchup)
6	0.166667	(Chips, Ketchup)
7	0.333333	(Buns, Hotdogs)
8	0.166667	(Buns, Ketchup)
9	0.166667	(Buns, Hotdogs, Ketchup)
10	0.333333	(Hotdogs, Chips)
11	0.500000	(Coke, Chips)
12	0.333333	(Coke, Hotdogs)
13	0.333333	(Coke, Hotdogs, Chips)

```
from mlxtend.frequent_patterns import association_rules
rules_ap = association_rules(frequent_itemsets_ap, metric="confidence", min_threshold=0)
rules_fp = association_rules(frequent_itemsets_fp, metric="confidence", min_threshold=0)
```

```
print(rules_ap)
```

	antecedents	consequents	...	leverage	conviction
0	(Buns)	(Hotdogs)	...	0.111111	inf
1	(Hotdogs)	(Buns)	...	0.111111	1.333333
2	(Buns)	(Ketchup)	...	0.055556	1.333333
3	(Ketchup)	(Buns)	...	0.055556	1.333333
4	(Coke)	(Chips)	...	0.166667	inf
5	(Chips)	(Coke)	...	0.166667	2.000000
6	(Hotdogs)	(Chips)	...	-0.111111	0.666667
7	(Chips)	(Hotdogs)	...	-0.111111	0.666667
8	(Chips)	(Ketchup)	...	-0.055556	0.888889
9	(Ketchup)	(Chips)	...	-0.055556	0.666667
10	(Coke)	(Hotdogs)	...	0.000000	1.000000
11	(Hotdogs)	(Coke)	...	0.000000	1.000000
12	(Hotdogs)	(Ketchup)	...	-0.055556	0.888889
13	(Ketchup)	(Hotdogs)	...	-0.055556	0.666667
14	(Buns, Hotdogs)	(Ketchup)	...	0.055556	1.333333
15	(Buns, Ketchup)	(Hotdogs)	...	0.055556	inf
16	(Hotdogs, Ketchup)	(Buns)	...	0.111111	inf
17	(Buns)	(Hotdogs, Ketchup)	...	0.111111	1.666667
18	(Hotdogs)	(Buns, Ketchup)	...	0.055556	1.111111
19	(Ketchup)	(Buns, Hotdogs)	...	0.055556	1.333333
20	(Coke, Hotdogs)	(Chips)	...	0.111111	inf
21	(Coke, Chips)	(Hotdogs)	...	0.000000	1.000000
22	(Hotdogs, Chips)	(Coke)	...	0.166667	inf
23	(Coke)	(Hotdogs, Chips)	...	0.166667	2.000000
24	(Hotdogs)	(Coke, Chips)	...	0.000000	1.000000
25	(Chips)	(Coke, Hotdogs)	...	0.111111	1.333333

[26 rows x 9 columns]

```
print(rules_fp)
```

	antecedents	consequents	...	leverage	conviction
0	(Hotdogs)	(Ketchup)	...	-0.055556	0.888889
1	(Ketchup)	(Hotdogs)	...	-0.055556	0.666667
2	(Chips)	(Ketchup)	...	-0.055556	0.888889
3	(Ketchup)	(Chips)	...	-0.055556	0.666667
4	(Buns)	(Hotdogs)	...	0.111111	inf
5	(Hotdogs)	(Buns)	...	0.111111	1.333333
6	(Buns)	(Ketchup)	...	0.055556	1.333333
7	(Ketchup)	(Buns)	...	0.055556	1.333333
8	(Buns, Hotdogs)	(Ketchup)	...	0.055556	1.333333
9	(Buns, Ketchup)	(Hotdogs)	...	0.055556	inf
10	(Hotdogs, Ketchup)	(Buns)	...	0.111111	inf
11	(Buns)	(Hotdogs, Ketchup)	...	0.111111	1.666667
12	(Hotdogs)	(Buns, Ketchup)	...	0.055556	1.111111
13	(Ketchup)	(Buns, Hotdogs)	...	0.055556	1.333333
14	(Hotdogs)	(Chips)	...	-0.111111	0.666667
15	(Chips)	(Hotdogs)	...	-0.111111	0.666667
16	(Coke)	(Chips)	...	0.166667	inf
17	(Chips)	(Coke)	...	0.166667	2.000000
18	(Coke)	(Hotdogs)	...	0.000000	1.000000
19	(Hotdogs)	(Coke)	...	0.000000	1.000000
20	(Coke, Hotdogs)	(Chips)	...	0.111111	inf

21	(Coke, Chips)	(Hotdogs)	...	0.000000	1.000000
22	(Hotdogs, Chips)	(Coke)	...	0.166667	inf
23	(Coke)	(Hotdogs, Chips)	...	0.166667	2.000000
24	(Hotdogs)	(Coke, Chips)	...	0.000000	1.000000
25	(Chips)	(Coke, Hotdogs)	...	0.111111	1.333333

[26 rows x 9 columns]