In [8]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from mlxtend.frequent_patterns import apriori, association_rules
```

In [9]:
```
dataset = [
    ['milk', 'bread', 'nuts', 'apple'],
    ['milk', 'bread', 'nuts'],
    ['milk', 'bread'],
    ['milk', 'apple'],
    ['bread', 'apple'],
    ['milk', 'bread', 'apple'],
    ['milk', 'bread', 'apple'],
    ['bread', 'nuts']
]
```

In [10]:
```
from mlxtend.preprocessing import TransactionEncoder
te= TransactionEncoder()
te_array = te.fit(dataset).transform(dataset)
df = pd.DataFrame(te_array, columns = te.columns_)
```

In [11]:
```
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  False  False
5   True   True   True  False
6   True   True   True  False
7  False   True  False   True
```

In [12]:
```
frequent_itemsets = apriori(df, min_support = 0.3, use_colnames = True)
print("\n Frequent Itemsets:")
print(frequent_itemsets)
```

```
 Frequent Itemsets:
   support              itemsets
0    0.625               (apple)
1    0.875               (bread)
2    0.750                (milk)
3    0.375                (nuts)
4    0.500        (bread, apple)
5    0.500         (apple, milk)
6    0.625         (bread, milk)
7    0.375         (nuts, bread)
8    0.375  (bread, apple, milk)
```

In [13]:
```
rules = association_rules(frequent_itemsets, metric="lift", min_threshold = 1.0)
print("\n Association Rules:")
print(rules[['antecedents','consequents','support','confidence','lift']])
```

```
 Association Rules:
     antecedents     consequents  support  confidence      lift
0         (apple)          (milk)    0.500    0.800000  1.066667
1          (milk)         (apple)    0.500    0.666667  1.066667
2          (nuts)         (bread)    0.375    1.000000  1.142857
3         (bread)          (nuts)    0.375    0.428571  1.142857
4  (apple, bread)          (milk)    0.375    0.750000  1.000000
5          (milk)  (apple, bread)    0.375    0.500000  1.000000
```

In [14]:
```
rules = rules.sort_values(by='lift', ascending=False)
print("\n Top Rules by Lift:")
print(rules[['antecedents','consequents','support','confidence','lift']])
```

```
 Top Rules by Lift:
     antecedents     consequents  support  confidence      lift
3         (bread)          (nuts)    0.375    0.428571  1.142857
2          (nuts)         (bread)    0.375    1.000000  1.142857
1          (milk)         (apple)    0.500    0.666667  1.066667
0         (apple)          (milk)    0.500    0.800000  1.066667
4  (apple, bread)          (milk)    0.375    0.750000  1.000000
5          (milk)  (apple, bread)    0.375    0.500000  1.000000
```