```
In [ ]:  import csv
         from mlxtend.preprocessing import TransactionEncoder
         from mlxtend.frequent_patterns import apriori, association_rules
```

```
In [ ]:  dataset = []
         with open('Market_Basket_Optimisation.csv') as file:
           reader = csv.reader(file, delimiter=',')
           for row in reader:
             dataset += [row]
```

```
In [5]:  dataset
```

```
          'antioxidant juice ',
          'frozen smoothie',
          'spinach',
          'olive oil'],
         ['burgers', 'meatballs', 'eggs'],
         ['chutney'],
         ['turkey', 'avocado'],
         ['mineral water', 'milk', 'energy bar', 'whole wheat rice', 'green te
        a'],
         ['low fat yogurt'],
         ['whole wheat pasta', 'french fries'],
         ['soup', 'light cream', 'shallot'],
         ['frozen vegetables', 'spaghetti', 'green tea'],
         ['french fries'],
         ['eggs', 'pet food'],
         ['cookies'],
         ['turkey', 'burgers', 'mineral water', 'eggs', 'cooking oil'],
         ['spaghetti', 'champagne', 'cookies'],
         ['mineral water', 'salmon'],
         ['mineral water'],
         ['shrimp'
```

```
In [7]:  len(dataset)
```

```
/usr/local/lib/python3.10/dist-packages/ipykernel/ipkernel.py:283: Deprec
ationWarning: `should_run_async` will not call `transform_cell` automatic
ally in the future. Please pass the result to `transformed_cell` argument
and any exception that happen during thetransform in `preprocessing_exc_t
uple` in IPython 7.17 and above.
  and should_run_async(code)
```

```
Out[7]:  7501
```

```
In [8]:  te = TransactionEncoder()
         x = te.fit_transform(dataset)
```

```
/usr/local/lib/python3.10/dist-packages/ipykernel/ipkernel.py:283: Deprec
ationWarning: `should_run_async` will not call `transform_cell` automatic
ally in the future. Please pass the result to `transformed_cell` argument
and any exception that happen during thetransform in `preprocessing_exc_t
uple` in IPython 7.17 and above.
  and should_run_async(code)
```

In [9]:
```python
x
```

```
/usr/local/lib/python3.10/dist-packages/ipykernel/ipkernel.py:283: Deprec
ationWarning: `should_run_async` will not call `transform_cell` automatic
ally in the future. Please pass the result to `transformed_cell` argument
and any exception that happen during thetransform in `preprocessing_exc_t
uple` in IPython 7.17 and above.
  and should_run_async(code)
```

Out[9]:
```
array([[False,  True,  True, ...,  True, False, False],
       [False, False, False, ..., False, False, False],
       [False, False, False, ..., False, False, False],
       ...,
       [False, False, False, ..., False, False, False],
       [False, False, False, ..., False, False, False],
       [False, False, False, ..., False,  True, False]])
```

In [14]:
```python
df = pd.DataFrame(x, columns=te.columns_)
```

```
/usr/local/lib/python3.10/dist-packages/ipykernel/ipkernel.py:283: Deprec
ationWarning: `should_run_async` will not call `transform_cell` automatic
ally in the future. Please pass the result to `transformed_cell` argument
and any exception that happen during thetransform in `preprocessing_exc_t
uple` in IPython 7.17 and above.
  and should_run_async(code)
```

In [11]:
```python
len(te.columns_)
```

```
/usr/local/lib/python3.10/dist-packages/ipykernel/ipkernel.py:283: Deprec
ationWarning: `should_run_async` will not call `transform_cell` automatic
ally in the future. Please pass the result to `transformed_cell` argument
and any exception that happen during thetransform in `preprocessing_exc_t
uple` in IPython 7.17 and above.
  and should_run_async(code)
```

Out[11]: 120

In [17]:
```
df.head()
```

/usr/local/lib/python3.10/dist-packages/ipykernel/ipkernel.py:283: Deprec
ationWarning: `should_run_async` will not call `transform_cell` automatic
ally in the future. Please pass the result to `transformed_cell` argument
and any exception that happen during thetransform in `preprocessing_exc_t
uple` in IPython 7.17 and above.
  and should_run_async(code)

Out[17]:

	asparagus	almonds	antioxydant juice	asparagus	avocado	babies food	bacon	barbecue sauce	black tea
0	False	True	True	False	True	False	False	False	False
1	False	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False	False
3	False	False	False	False	True	False	False	False	False
4	False	False	False	False	False	False	False	False	False

5 rows × 120 columns

In [20]:
```
df.shape
```

/usr/local/lib/python3.10/dist-packages/ipykernel/ipkernel.py:283: Deprec
ationWarning: `should_run_async` will not call `transform_cell` automatic
ally in the future. Please pass the result to `transformed_cell` argument
and any exception that happen during thetransform in `preprocessing_exc_t
uple` in IPython 7.17 and above.
  and should_run_async(code)

Out[20]: (7501, 120)

In [24]:
```
# 1. Frequent itemsets
freq_itemset = apriori(df, min_support=0.01,use_colnames=True)
```

/usr/local/lib/python3.10/dist-packages/ipykernel/ipkernel.py:283: Deprec
ationWarning: `should_run_async` will not call `transform_cell` automatic
ally in the future. Please pass the result to `transformed_cell` argument
and any exception that happen during thetransform in `preprocessing_exc_t
uple` in IPython 7.17 and above.
  and should_run_async(code)

In [25]:
```python
freq_itemset
```

```
/usr/local/lib/python3.10/dist-packages/ipykernel/ipkernel.py:283: Deprec
ationWarning: `should_run_async` will not call `transform_cell` automatic
ally in the future. Please pass the result to `transformed_cell` argument
and any exception that happen during thetransform in `preprocessing_exc_t
uple` in IPython 7.17 and above.
  and should_run_async(code)
```

Out[25]:

	support	itemsets
0	0.020397	(almonds)
1	0.033329	(avocado)
2	0.010799	(barbecue sauce)
3	0.014265	(black tea)
4	0.011465	(body spray)
...	...	...
252	0.011065	(milk, ground beef, mineral water)
253	0.017064	(ground beef, mineral water, spaghetti)
254	0.015731	(milk, mineral water, spaghetti)
255	0.010265	(olive oil, mineral water, spaghetti)
256	0.011465	(spaghetti, mineral water, pancakes)

257 rows × 2 columns

In [ ]:
```python
# Find the rules
rules = association_rules(freq_itemset, metric='confidence', min_threshold=
```

In [29]:
```python
rules = rules[['antecedents','consequents','support','confidence']]
```

```
/usr/local/lib/python3.10/dist-packages/ipykernel/ipkernel.py:283: Deprec
ationWarning: `should_run_async` will not call `transform_cell` automatic
ally in the future. Please pass the result to `transformed_cell` argument
and any exception that happen during thetransform in `preprocessing_exc_t
uple` in IPython 7.17 and above.
  and should_run_async(code)
```

In [31]:
```python
rules.head(10)
```

```
/usr/local/lib/python3.10/dist-packages/ipykernel/ipkernel.py:283: Deprec
ationWarning: `should_run_async` will not call `transform_cell` automatic
ally in the future. Please pass the result to `transformed_cell` argument
and any exception that happen during thetransform in `preprocessing_exc_t
uple` in IPython 7.17 and above.
  and should_run_async(code)
```

Out[31]:

	antecedents	consequents	support	confidence
0	(avocado)	(mineral water)	0.011598	0.348000
1	(burgers)	(eggs)	0.028796	0.330275
2	(burgers)	(french fries)	0.021997	0.252294
3	(burgers)	(mineral water)	0.024397	0.279817
4	(cake)	(mineral water)	0.027463	0.338816
5	(cereals)	(mineral water)	0.010265	0.398964
6	(chicken)	(mineral water)	0.022797	0.380000
7	(chicken)	(spaghetti)	0.017198	0.286667
8	(cooking oil)	(chocolate)	0.013598	0.266319
9	(chocolate)	(mineral water)	0.052660	0.321400

In [32]:
```python
rules[rules['antecedents'] == {'cake'}]
```

```
/usr/local/lib/python3.10/dist-packages/ipykernel/ipkernel.py:283: Deprec
ationWarning: `should_run_async` will not call `transform_cell` automatic
ally in the future. Please pass the result to `transformed_cell` argument
and any exception that happen during thetransform in `preprocessing_exc_t
uple` in IPython 7.17 and above.
  and should_run_async(code)
```

Out[32]:

	antecedents	consequents	support	confidence
4	(cake)	(mineral water)	0.027463	0.338816

In [33]:
```python
rules[rules['antecedents'] == {'milk'}]
```

```
/usr/local/lib/python3.10/dist-packages/ipykernel/ipkernel.py:283: Deprec
ationWarning: `should_run_async` will not call `transform_cell` automatic
ally in the future. Please pass the result to `transformed_cell` argument
and any exception that happen during thetransform in `preprocessing_exc_t
uple` in IPython 7.17 and above.
  and should_run_async(code)
```

Out[33]:

	antecedents	consequents	support	confidence
31	(milk)	(mineral water)	0.047994	0.370370
34	(milk)	(spaghetti)	0.035462	0.273663

In [ ]: