In [1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from apyori import apriori
```

In [2]:
```
store_data = pd.read_csv("store_data.csv", header=None)
display(store_data.head())
print(store_data.shape)
```

	0	1	2	3	4	5	6	7	8	9	1(
0	shrimp	almonds	avocado	vegetables mix	green grapes	whole weat flour	yams	cottage cheese	energy drink	tomato juice	lov fa yogu
1	burgers	meatballs	eggs	NaN	NaN	NaN	NaN	NaN	NaN	NaN	Nal
2	chutney	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	Nal
3	turkey	avocado	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	Nal
4	mineral water	milk	energy bar	whole wheat rice	green tea	NaN	NaN	NaN	NaN	NaN	Nal

(7501, 20)

In [3]:
```
records = []
for i in range(1, 7501):
    records.append([str(store_data.values[i, j]) for j in range(0, 20)])
```

In [4]:
```
print(type(records))
```

<class 'list'>

In [5]:
```
association_rules = apriori(records, min_support=0.0045, min_confidence=0.2, min_lift=3, min_length=
association_results = list(association_rules)
```

In [6]:
```
print("There are {} Relation derived.".format(len(association_results)))
```

There are 48 Relation derived.

In [7]:
```
for i in range(0, len(association_results)):
    print(association_results[i][0])
```

```
frozenset({'light cream', 'chicken'})
frozenset({'mushroom cream sauce', 'escalope'})
frozenset({'pasta', 'escalope'})
frozenset({'herb & pepper', 'ground beef'})
frozenset({'tomato sauce', 'ground beef'})
frozenset({'olive oil', 'whole wheat pasta'})
frozenset({'pasta', 'shrimp'})
frozenset({'light cream', 'chicken', 'nan'})
frozenset({'chocolate', 'frozen vegetables', 'shrimp'})
frozenset({'ground beef', 'cooking oil', 'spaghetti'})
frozenset({'mushroom cream sauce', 'escalope', 'nan'})
frozenset({'pasta', 'escalope', 'nan'})
frozenset({'frozen vegetables', 'ground beef', 'spaghetti'})
frozenset({'frozen vegetables', 'milk', 'olive oil'})
frozenset({'mineral water', 'frozen vegetables', 'shrimp'})
frozenset({'frozen vegetables', 'olive oil', 'spaghetti'})
frozenset({'frozen vegetables', 'shrimp', 'spaghetti'})
frozenset({'frozen vegetables', 'tomatoes', 'spaghetti'})
frozenset({'grated cheese', 'ground beef', 'spaghetti'})
frozenset({'mineral water', 'herb & pepper', 'ground beef'})
frozenset({'herb & pepper', 'nan', 'ground beef'})
frozenset({'herb & pepper', 'ground beef', 'spaghetti'})
frozenset({'olive oil', 'milk', 'ground beef'})
frozenset({'tomato sauce', 'nan', 'ground beef'})
frozenset({'shrimp', 'ground beef', 'spaghetti'})
frozenset({'olive oil', 'milk', 'spaghetti'})
frozenset({'mineral water', 'soup', 'olive oil'})
frozenset({'olive oil', 'whole wheat pasta', 'nan'})
frozenset({'pasta', 'shrimp', 'nan'})
frozenset({'pancakes', 'olive oil', 'spaghetti'})
frozenset({'chocolate', 'frozen vegetables', 'nan', 'shrimp'})
frozenset({'ground beef', 'nan', 'cooking oil', 'spaghetti'})
frozenset({'frozen vegetables', 'nan', 'ground beef', 'spaghetti'})
frozenset({'mineral water', 'frozen vegetables', 'milk', 'spaghetti'})
frozenset({'frozen vegetables', 'milk', 'nan', 'olive oil'})
frozenset({'mineral water', 'frozen vegetables', 'shrimp', 'nan'})
frozenset({'frozen vegetables', 'olive oil', 'nan', 'spaghetti'})
frozenset({'frozen vegetables', 'shrimp', 'nan', 'spaghetti'})
frozenset({'tomatoes', 'frozen vegetables', 'nan', 'spaghetti'})
frozenset({'nan', 'grated cheese', 'ground beef', 'spaghetti'})
frozenset({'mineral water', 'herb & pepper', 'nan', 'ground beef'})
frozenset({'herb & pepper', 'nan', 'ground beef', 'spaghetti'})
frozenset({'olive oil', 'milk', 'nan', 'ground beef'})
frozenset({'shrimp', 'nan', 'ground beef', 'spaghetti'})
frozenset({'olive oil', 'milk', 'nan', 'spaghetti'})
frozenset({'mineral water', 'soup', 'olive oil', 'nan'})
frozenset({'pancakes', 'olive oil', 'nan', 'spaghetti'})
frozenset({'milk', 'nan', 'mineral water', 'spaghetti', 'frozen vegetables'})
```

In [8]:
```
for item in association_results:
    pair = item[0]
    items = [x for x in pair]
    print("Rule: " + items[0] + " -> " + items[1])
    print("Support: " + str(item[1]))
    print("Confidence: " + str(item[2][0][2]))
    print("Lift: " + str(item[2][0][3]))
    print("=====================================")
```

```
Rule: light cream -> chicken
Support: 0.004533333333333334
Confidence: 0.2905982905982906
Lift: 4.843304843304844
=====================================
Rule: mushroom cream sauce -> escalope
Support: 0.005733333333333333
Confidence: 0.30069930069930073
Lift: 3.7903273197390845
=====================================
Rule: pasta -> escalope
Support: 0.005866666666666667
Confidence: 0.37288135593220345
Lift: 4.700185158809287
=====================================
Rule: herb & pepper -> ground beef
Support: 0.016
Confidence: 0.3234501347708895
Lift: 3.2915549671393096
```

In [ ]: