CAPSTONE PROJECT REPORT

Association Rule Mining: Market Basket Analysis

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Apriori is a statistical algorithm for implementing associate rule mining, that primarily relies on three components: Life, Support and Confidence. Using this algorithm try to find the rules that describe the relation between each of the products that were brought by the customers as described in

Dataset Link: Store Data https://drive.google.com/file/d/1y5DYn0dGoSbC22xowBq2d4po6h1JxcTQ/view?usp = sharing

```
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
from apyori import apriori

store_data = pd.read_csv('store_data (1).csv')
store_data.head()
```

	shrimp	almonds	avocado	vegetables mix		whole weat flour	yams	cottage cheese	energy drink	tomato juice	low fat yogurt	green tea	honey	salad	mineral water	salmon	antioxydant juice	frozen smoothie
0	burgers	meatballs	eggs	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
1	chutney	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2	turkey	avocado	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
3	mineral water	milk	energy bar	whole wheat rice	green tea	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
4	low fat yogurt	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

```
store_data = pd.read_csv('store_data (1).csv', header=None)
store data.head()
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   shrimp
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                                                  weat
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```

```
records = []
for i in range(0, 7501):
   records.append([str(store_data.values[i,j]) for j in range(0, 20)])
association_rules = apriori(records, min_support=0.0045, min_confidence=0.2, min_lift=3, min_length=2)
association_results = list(association_rules)
```

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tea

print(association results)

milk

wheat rice

[RelationRecord(items=frozenset({'chicken', 'light cream'}), support=0.004532728969470737, ordered_statistics=[OrderedStatistics (items_base=frozenset({'light cream'}), items_add=frozenset({'chicken'}), confidence=0.29059829059829057, lift=4.8439506172839 5)]), RelationRecord(items=frozenset({'escalope', 'mushroom cream sauce'}), support=0.005732568990801226, ordered_statistics=[0.005732568990801226, ordered_statistics=[0.00573256899080126]] rderedStatistic(items_base=frozenset({'mushroom cream sauce'}), items_add=frozenset({'escalope'}), confidence=0.3006993006993007, lift=3.790832696715049)]), RelationRecord(items=frozenset({'escalope', 'pasta'}), support=0.005865884548726837, ordered_states. istics=[OrderedStatistic(items_base=frozenset({'pasta'}), items_add=frozenset({'escalope'}), confidence=0.3728813559322034, litems_add=frozenset({'escalope'}), confidence=0.372881355932034, litems_add=frozenset({'escalope'}), confidence=0.372881355932034, litems_add=frozenset({'escalope'}), confidence=0.372881355932034, litems_add=frozenset({'escalope'}), confidence=0.372881355932034, litems_add=frozenset({'escalope'}), confidence=0.372881355932034, litems_add=frozenset({'escalope'}), confidence=0.37288135932034, litems_add=frozenset({'escalope'}), confidence=0.37288135034, litems_add=frozenset(t=4.700811850163794)]), RelationRecord(items=frozenset({'herb & pepper', 'ground beef'}), support=0.015997866951073192, ordered_statistic(items_base=frozenset({'herb & pepper'}), items_add=frozenset({'ground beef'}), confidence=0.32345 01347708895, lift=3.2919938411349285)]), RelationRecord(items=frozenset({'ground beef', 'tomato sauce'}), support=0.005332622337024397, ordered_statistics=[OrderedStatistic(items_base=frozenset({'tomato sauce'}), items_add=frozenset({'ground beef'}), contact of the sauce'}), items_add=frozenset({'ground beef'}), items_add=frozenset({'gr fidence=0.3773584905660377, lift=3.840659481324083)]), RelationRecord(items=frozenset({'olive oil', 'whole wheat pasta'}), sup ort=0.007998933475536596, ordered_statistics=[OrderedStatistic(items_base=frozenset({'whole wheat pasta'}), items_add=frozenset ({'olive oil'}), confidence=0.2714932126696833, lift=4.122410097642296)]), RelationRecord(items=frozenset({'pasta', 'shrimp'}), support=0.005065991201173177, ordered_statistics=[OrderedStatistic(items_base=frozenset({'pasta'}), items_add=frozenset({'shrimp'}), confidence=0.3220338983050847, lift=4.506672147735896)]), RelationRecord(items=frozenset({'chicken', 'nan', 'light cream }), support=0.004532728969470737, ordered statistics=[OrderedStatistic(items base=frozenset({'light cream'}), items add=frozen set({'chicken', 'nan'}), confidence=0.29059829059829057, lift=4.84395061728395), OrderedStatistic(items_base=frozenset({'light cream', 'nan'}), items_add=frozenset({'chicken'}), confidence=0.29059829059829057, lift=4.84395061728395)]), RelationRecord(items=frozenset({'chocolate', 'shrimp', 'frozen vegetables'}), support=0.005332622317024397, ordered_statistics=[OrderedStatistics=