

Import the Libraries

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

Installing Apyori package

```
[ ] !pip install apyori

Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/
Collecting apyori
  Downloading apyori-1.1.2.tar.gz (8.6 kB)
Building wheels for collected packages: apyori
  Building wheel for apyori (setup.py) ... done
  Created wheel for apyori: filename=apyori-1.1.2-py3-none-any.whl size=5974 sha256=2b5dfdb8768f8a38219e30e0a4c13e679d4ef8d7aa245c7223bb13d6c5e3a204
  Stored in directory: /root/.cache/pip/wheels/cb/f6/e1/57973c631d27efd1a2f375bd6a83b2a616c4021f24aab84080
Successfully built apyori
Installing collected packages: apyori
Successfully installed apyori-1.1.2
```

Importing the Dataset

```
[ ] store_data = pd.read_csv("/content/sample_data/store_data.csv")

store_data.head()
```

	shrimp	almonds	avocado	vegetables mix	green grapes	whole weat flour	yams	cottage cheese	energy drink	tomato juice	low fat yogurt	green tea	honey	salad	mineral water	salmon	antioxydant juice	frozen smoothie	spinach	olive oil
0	burgers	meatballs	eggs	NaN	NaN	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	NaN	NaN
2	turkey	avocado	NaN	NaN	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	NaN	NaN
4	low fat yogurt	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

```
[ ] store_data = pd.read_csv('/content/sample_data/store_data.csv', header=None)

store_data.head()
```

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
0	shrimp	almonds	avocado	vegetables mix	green grapes	whole weat flour	yams	cottage cheese	energy drink	tomato juice	low fat yogurt	green tea	honey	salad	mineral water	salmon	antioxydant juice	frozen smoothie	spl
1	burgers	meatballs	eggs	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2	chutney	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
3	turkey	avocado	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
4	mineral water	milk	energy bar	whole wheat rice	green tea	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

Data Proprocessing

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

Applying Apriori

```
[ ] association_rules = apriori(records, min_support=0.0045, min_confidence=0.2, min_lift=3, min_length=2)
association_results = list(association_rules)

[ ] print(len(association_results))
```

```
[ ] print(association_results[0])
```

```
RelationRecord(items=frozenset({'chicken', 'light cream'}), support=0.004532728969470737, ordered_statistics=[OrderedStatistic(items_base=frozenset({'light cream'}), items_
```



Viewing the Results

```
▶ for item in association_results:

    # first index of the inner list
    # Contains base item and add item
    pair = item[0]
    items = [x for x in pair]
    print("Rule: " + items[0] + " -> " + items[1])

    #second index of the inner list
    print("Support: " + str(item[1]))

    #third index of the list located at 0th
    #of the third index of the inner list

    print("Confidence: " + str(item[2][0][2]))
    print("Lift: " + str(item[2][0][3]))
    print("=====")
```



Rule: chicken -> light cream
Support: 0.004532728969470737
Confidence: 0.29059829059829057
Lift: 4.84395061728395



=====
Rule: mushroom cream sauce -> escalope
Support: 0.005732568990801226
Confidence: 0.3006993006993007
Lift: 3.790832696715049

=====
Rule: escalope -> pasta
Support: 0.005865884548726837
Confidence: 0.3728813559322034
Lift: 4.700811850163794

=====
Rule: herb & pepper -> ground beef
Support: 0.015997866951073192
Confidence: 0.3234501347708895
Lift: 3.2919938411349285

=====
Rule: tomato sauce -> ground beef
Support: 0.005332622317024397
Confidence: 0.3773584905660377
Lift: 3.840659481324083

=====
Rule: olive oil -> whole wheat pasta
Support: 0.007998933475536596
Confidence: 0.2714932126696833
Lift: 4.122410097642296

=====
Rule: shrimp -> pasta
Support: 0.005065991201173177
Confidence: 0.3220338983050847
Lift: 4.506672147735896



Rule: chicken -> nan

Support: 0.004532728969470737



Confidence: 0.29059829059829057

Lift: 4.84395061728395

=====

Rule: frozen vegetables -> shrimp

Support: 0.005332622317024397

Confidence: 0.23255813953488375

Lift: 3.2545123221103784

=====

Rule: spaghetti -> cooking oil

Support: 0.004799360085321957

Confidence: 0.5714285714285714

Lift: 3.2819951870487856

=====

Rule: mushroom cream sauce -> escalope

Support: 0.005732568990801226

Confidence: 0.3006993006993007

Lift: 3.790832696715049

=====

Rule: escalope -> nan

Support: 0.005865884548726837

Confidence: 0.3728813559322034

Lift: 4.700811850163794

=====

Rule: frozen vegetables -> spaghetti

Support: 0.008665511265164644

Confidence: 0.31100478468899523

Lift: 3.165328208890303

=====

Rule: frozen vegetables -> olive oil

Support: 0.004799360085321957

Confidence: 0.20338983050847456



Rule: frozen vegetables -> shrimp

Support: 0.007199040127982935



Confidence: 0.30508474576271183

Lift: 3.200616332819722

=====

Rule: frozen vegetables -> spaghetti

Support: 0.005732568990801226

Confidence: 0.20574162679425836

Lift: 3.1240241752707125

=====

Rule: frozen vegetables -> spaghetti

Support: 0.005999200106652446

Confidence: 0.21531100478468898

Lift: 3.0131489680782684

=====

Rule: frozen vegetables -> spaghetti

Support: 0.006665777896280496

Confidence: 0.23923444976076558

Lift: 3.4980460188216425

=====

Rule: grated cheese -> spaghetti

Support: 0.005332622317024397

Confidence: 0.3225806451612903

Lift: 3.283144395325426

=====

Rule: mineral water -> herb & pepper

Support: 0.006665777896280496

Confidence: 0.39062500000000006

Lift: 3.975682666214383

=====

Rule: nan -> herb & pepper

Support: 0.015997866951073192

Confidence: 0.3234501347708895



Lift: 3.2919938411349285

=====



Rule: spaghetti -> herb & pepper

Support: 0.006399146780429276

Confidence: 0.3934426229508197

Lift: 4.004359721511667

=====

Rule: olive oil -> milk

Support: 0.004932675643247567

Confidence: 0.224242424242427

Lift: 3.40494417862839

=====

Rule: tomato sauce -> nan

Support: 0.005332622317024397

Confidence: 0.3773584905660377

Lift: 3.840659481324083

=====

Rule: shrimp -> spaghetti

Support: 0.005999200106652446

Confidence: 0.5232558139534884

Lift: 3.005315360233627

=====

Rule: olive oil -> spaghetti

Support: 0.007199040127982935

Confidence: 0.20300751879699247

Lift: 3.0825089038385434

=====

Rule: olive oil -> mineral water

Support: 0.005199306759098787

Confidence: 0.22543352601156072

Lift: 3.4230301186492245

=====

Rule: olive oil -> whole wheat pasta

Support: 0.007998933475536596



Confidence: 0.2714932126696833

Lift: 4.13077198425009



=====

Rule: shrimp -> pasta

Support: 0.005065991201173177

Confidence: 0.3220338983050847

Lift: 4.515095833993347

=====

Rule: olive oil -> spaghetti

Support: 0.005065991201173177

Confidence: 0.20105820105820105

Lift: 3.0529100529100526

=====

Rule: frozen vegetables -> shrimp

Support: 0.005332622317024397

Confidence: 0.23255813953488375

Lift: 3.260595522712454

=====

Rule: spaghetti -> cooking oil

Support: 0.004799360085321957

Confidence: 0.5714285714285714

Lift: 3.2819951870487856

=====

Rule: frozen vegetables -> spaghetti

Support: 0.008665511265164644

Confidence: 0.31100478468899523

Lift: 3.165328208890303

=====

Rule: frozen vegetables -> spaghetti

Support: 0.004532728969470737

Confidence: 0.28813559322033894

Lift: 3.0228043143297376

=====

Rule: frozen vegetables -> olive oil



Support: 0.004799360085321957
Confidence: 0.20338983050847456



Lift: 3.094578333963626

=====

Rule: frozen vegetables -> shrimp

Support: 0.007199040127982935
Confidence: 0.30508474576271183
Lift: 3.200616332819722

=====

Rule: frozen vegetables -> spaghetti

Support: 0.005732568990801226
Confidence: 0.20574162679425836
Lift: 3.1303609383037156

=====

Rule: frozen vegetables -> spaghetti

Support: 0.005999200106652446
Confidence: 0.21531100478468898
Lift: 3.0187810222242093

=====

Rule: frozen vegetables -> spaghetti

Support: 0.006665777896280496
Confidence: 0.23923444976076558
Lift: 3.4980460188216425

=====

Rule: grated cheese -> spaghetti

Support: 0.005332622317024397
Confidence: 0.3225806451612903
Lift: 3.283144395325426

=====

Rule: mineral water -> nan

Support: 0.006665777896280496
Confidence: 0.39062500000000006
Lift: 3.975682666214383

=====

Rule: spaghetti -> nan

Support: 0.006399146780429276

Confidence: 0.3934426229508197

Lift: 4.004359721511667

=====

Rule: olive oil -> nan

Support: 0.004932675643247567

Confidence: 0.224242424242427

Lift: 3.4118507591124225

=====

Rule: shrimp -> spaghetti
