


```
import numpy as np
import pandas as pd
import seaborn as sb
import matplotlib.pyplot as plt
```

```
from google.colab import drive
drive.mount('/content/drive')
```

 Mounted at /content/drive

```
grocery_data=pd.read_csv('/content/drive/MyDrive/ML lab/GroceryStoreDataSet.csv')
```

grocery_data

	MILK,BREAD,BISCUIT
0	BREAD,MILK,BISCUIT,CORNFLAKES
1	BREAD,TEA,BOURNVITA
2	JAM,MAGGI,BREAD,MILK
3	MAGGI,TEA,BISCUIT
4	BREAD,TEA,BOURNVITA
5	MAGGI,TEA,CORNFLAKES
6	MAGGI,BREAD,TEA,BISCUIT
7	JAM,MAGGI,BREAD,TEA
8	BREAD,MILK
9	COFFEE,COCK,BISCUIT,CORNFLAKES
10	COFFEE,COCK,BISCUIT,CORNFLAKES
11	COFFEE,SUGER,BOURNVITA
12	BREAD,COFFEE,COCK
13	BREAD,SUGER,BISCUIT
14	COFFEE,SUGER,CORNFLAKES
15	BREAD,SUGER,BOURNVITA
16	BREAD,COFFEE,SUGER
17	BREAD,COFFEE,SUGER
18	TEA,MILK,COFFEE,CORNFLAKES

```
grocery_data.rename(columns={"MILK,BREAD,BISCUIT":"PRODUCTS"},inplace=True)
```

grocery_data



PRODUCTS

0	BREAD,MILK,BISCUIT,CORNFLAKES
1	BREAD,TEA,BOURNVITA
2	JAM,MAGGI,BREAD,MILK
3	MAGGI,TEA,BISCUIT
4	BREAD,TEA,BOURNVITA
5	MAGGI,TEA,CORNFLAKES
6	MAGGI,BREAD,TEA,BISCUIT
7	JAM,MAGGI,BREAD,TEA
8	BREAD,MILK
9	COFFEE,COCK,BISCUIT,CORNFLAKES
10	COFFEE,COCK,BISCUIT,CORNFLAKES
11	COFFEE,SUGER,BOURNVITA
12	BREAD,COFFEE,COCK
13	BREAD,SUGER,BISCUIT
14	COFFEE,SUGER,CORNFLAKES
15	BREAD,SUGER,BOURNVITA
16	BREAD,COFFEE,SUGER
17	BREAD,COFFEE,SUGER
18	TEA,MILK,COFFEE,CORNFLAKES

```
data = list()
for i in grocery_data["PRODUCTS"]:
    i=i.split(",")
    data.append(i)
```

data



```
[['BREAD', 'MILK', 'BISCUIT', 'CORNFLAKES'],
 ['BREAD', 'TEA', 'BOURNVITA'],
 ['JAM', 'MAGGI', 'BREAD', 'MILK'],
 ['MAGGI', 'TEA', 'BISCUIT'],
 ['BREAD', 'TEA', 'BOURNVITA'],
 ['MAGGI', 'TEA', 'CORNFLAKES'],
 ['MAGGI', 'BREAD', 'TEA', 'BISCUIT'],
 ['JAM', 'MAGGI', 'BREAD', 'TEA'],
 ['BREAD', 'MILK'],
 ['COFFEE', 'COCK', 'BISCUIT', 'CORNFLAKES'],
 ['COFFEE', 'COCK', 'BISCUIT', 'CORNFLAKES'],
 ['COFFEE', 'SUGER', 'BOURNVITA'],
 ['BREAD', 'COFFEE', 'COCK'],
```

```
['BREAD', 'SUGER', 'BISCUIT'],
['COFFEE', 'SUGER', 'CORNFLAKES'],
['BREAD', 'SUGER', 'BOURNVITA'],
['BREAD', 'COFFEE', 'SUGER'],
['BREAD', 'COFFEE', 'SUGER'],
['TEA', 'MILK', 'COFFEE', 'CORNFLAKES']]
```

```
from mlxtend.preprocessing import TransactionEncoder
encode=TransactionEncoder()
encode_data=encode.fit(data).transform(data)
store_data=pd.DataFrame(encode_data,columns=encode.columns_)
store_data
```



	BISCUIT	BOURNVITA	BREAD	COCK	COFFEE	CORNFLAKES	JAM	MAGGI	MILK	SUG
0	True	False	True	False	False	True	False	False	True	Fal
1	False	True	True	False	False	False	False	False	False	Fal
2	False	False	True	False	False	False	True	True	True	Fal
3	True	False	False	False	False	False	False	True	False	Fal
4	False	True	True	False	False	False	False	False	False	Fal
5	False	False	False	False	False	True	False	True	False	Fal
6	True	False	True	False	False	False	False	True	False	Fal
7	False	False	True	False	False	False	True	True	False	Fal
8	False	False	True	False	False	False	False	False	True	Fal
9	True	False	False	True	True	True	False	False	False	Fal
10	True	False	False	True	True	True	False	False	False	Fal
11	False	True	False	False	True	False	False	False	False	Tr
12	False	False	True	True	True	False	False	False	False	Fal
13	True	False	True	False	False	False	False	False	False	Tr
14	False	False	False	False	True	True	False	False	False	Tr
15	False	True	True	False	False	False	False	False	False	Tr
16	False	False	True	False	True	False	False	False	False	Tr
17	False	False	True	False	True	False	False	False	False	Tr
18	False	False	False	False	True	True	False	False	True	Fal

```
store_data.head()
```



	BISCUIT	BOURNVITA	BREAD	COCK	COFFEE	CORNFLAKES	JAM	MAGGI	MILK	SUGE
0	True	False	True	False	False	True	False	False	True	Fals
1	False	True	True	False	False	False	False	False	False	Fals
2	False	False	True	False	False	False	True	True	True	Fals
3	True	False	False	False	False	False	False	True	False	Fals
4	False	True	True	False	False	False	False	False	False	Fals

```
!pip install apyori
```



```
Collecting apyori
  Downloading apyori-1.1.2.tar.gz (8.6 kB)
  Preparing metadata (setup.py) ... done
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=5955
  Stored in directory: /root/.cache/pip/wheels/c4/1a/79/20f55c470a50bb3702a8c
Successfully built apyori
Installing collected packages: apyori
Successfully installed apyori-1.1.2
```

```
from apyori import apriori
```

```
association_rules=apriori(data,min_support=0.0045,min_confidence=0.2,min_lift=3,min_length=2)
association_rules
```



```
<generator object apriori at 0x7def39544200>
```

```
association_list=list(association_rules)
association_list
```



```
[RelationRecord(items=frozenset({'MAGGI', 'JAM'}),
support=0.10526315789473684, ordered_statistics=
[OrderedStatistic(items_base=frozenset({'JAM'}),
items_add=frozenset({'MAGGI'}), confidence=1.0, lift=3.8000000000000003),
OrderedStatistic(items_base=frozenset({'MAGGI'}),
items_add=frozenset({'JAM'}), confidence=0.4, lift=3.8000000000000003)]),
RelationRecord(items=frozenset({'BREAD', 'BISCUIT', 'CORNFLAKES'}),
support=0.05263157894736842, ordered_statistics=
[OrderedStatistic(items_base=frozenset({'BREAD', 'CORNFLAKES'}),
items_add=frozenset({'BISCUIT'}), confidence=1.0, lift=3.1666666666666667)]),
RelationRecord(items=frozenset({'COCK', 'BISCUIT', 'COFFEE'}),
support=0.10526315789473684, ordered_statistics=
[OrderedStatistic(items_base=frozenset({'COCK'}),
items_add=frozenset({'BISCUIT', 'COFFEE'}), confidence=0.6666666666666666,
lift=6.333333333333333), OrderedStatistic(items_base=frozenset({'BISCUIT',
'COFFEE'}), items_add=frozenset({'COCK'}), confidence=1.0,
lift=6.333333333333334)]),
RelationRecord(items=frozenset({'COCK', 'BISCUIT', 'CORNFLAKES'}),
support=0.10526315789473684, ordered_statistics=
[OrderedStatistic(items_base=frozenset({'BISCUIT'}),
```

```

items_add=frozenset({'COCK', 'CORNFLAKES'}), confidence=0.3333333333333333,
lift=3.1666666666666665), OrderedStatistic(items_base=frozenset({'COCK'}),
items_add=frozenset({'BISCUIT', 'CORNFLAKES'}),
confidence=0.6666666666666666, lift=4.222222222222222),
OrderedStatistic(items_base=frozenset({'CORNFLAKES'}),
items_add=frozenset({'COCK', 'BISCUIT'}), confidence=0.3333333333333333,
lift=3.1666666666666665), OrderedStatistic(items_base=frozenset({'COCK',
'BISCUIT'}), items_add=frozenset({'CORNFLAKES'}), confidence=1.0,
lift=3.1666666666666667), OrderedStatistic(items_base=frozenset({'BISCUIT',
'CORNFLAKES'}), items_add=frozenset({'COCK'}),
confidence=0.6666666666666666, lift=4.222222222222222),
OrderedStatistic(items_base=frozenset({'COCK', 'CORNFLAKES'}),
items_add=frozenset({'BISCUIT'}), confidence=1.0, lift=3.1666666666666667)]),
RelationRecord(items=frozenset({'BISCUIT', 'CORNFLAKES', 'COFFEE'}),
support=0.10526315789473684, ordered_statistics=
[OrderedStatistic(items_base=frozenset({'CORNFLAKES'}),
items_add=frozenset({'BISCUIT', 'COFFEE'}), confidence=0.3333333333333333,
lift=3.1666666666666665), OrderedStatistic(items_base=frozenset({'BISCUIT',
'COFFEE'}), items_add=frozenset({'CORNFLAKES'}), confidence=1.0,
lift=3.1666666666666667)]),
RelationRecord(items=frozenset({'MILK', 'BISCUIT', 'CORNFLAKES'}),
support=0.05263157894736842, ordered_statistics=
[OrderedStatistic(items_base=frozenset({'MILK', 'BISCUIT'}),
items_add=frozenset({'CORNFLAKES'}), confidence=1.0,
lift=3.1666666666666667)]),
RelationRecord(items=frozenset({'BISCUIT', 'MAGGI', 'TEA'}),
support=0.10526315789473684, ordered_statistics=
[OrderedStatistic(items_base=frozenset({'MAGGI'}),
items_add=frozenset({'BISCUIT', 'TEA'}), confidence=0.4,
lift=3.8000000000000003), OrderedStatistic(items_base=frozenset({'BISCUIT',
'TEA'}), items_add=frozenset({'MAGGI'}), confidence=1.0,
lift=3.8000000000000003)]),
RelationRecord(items=frozenset({'SUGER', 'BOURNVITA', 'COFFEE'}),
support=0.05263157894736842, ordered_statistics=
[OrderedStatistic(items_base=frozenset({'BOURNVITA', 'COFFEE'}),
items_add=frozenset({'SUGER'}), confidence=1.0, lift=3.1666666666666667)]),
RelationRecord(items=frozenset({'BREAD', 'MILK', 'CORNFLAKES'}),
support=0.05263157894736842, ordered_statistics=

```

```

for i in range(0,len(association_list)):
    print(association_list[i][0])

```

```

⇒ frozenset({'MAGGI', 'JAM'})
   frozenset({'BREAD', 'BISCUIT', 'CORNFLAKES'})
   frozenset({'COCK', 'BISCUIT', 'COFFEE'})
   frozenset({'COCK', 'BISCUIT', 'CORNFLAKES'})
   frozenset({'BISCUIT', 'CORNFLAKES', 'COFFEE'})
   frozenset({'MILK', 'BISCUIT', 'CORNFLAKES'})
   frozenset({'BISCUIT', 'MAGGI', 'TEA'})
   frozenset({'SUGER', 'BOURNVITA', 'COFFEE'})
   frozenset({'BREAD', 'MILK', 'CORNFLAKES'})
   frozenset({'BREAD', 'MAGGI', 'JAM'})
   frozenset({'BREAD', 'MILK', 'JAM'})
   frozenset({'COCK', 'CORNFLAKES', 'COFFEE'})
   frozenset({'MILK', 'CORNFLAKES', 'COFFEE'})
   frozenset({'TEA', 'CORNFLAKES', 'COFFEE'})
   frozenset({'MILK', 'TEA', 'COFFEE'})
   frozenset({'MILK', 'CORNFLAKES', 'TEA'})
   frozenset({'MILK', 'MAGGI', 'JAM'})
   frozenset({'MAGGI', 'JAM', 'TEA'})

```

```
frozenset({'BREAD', 'MILK', 'BISCUIT', 'CORNFLAKES'})
frozenset({'BREAD', 'BISCUIT', 'MAGGI', 'TEA'})
frozenset({'COCK', 'BISCUIT', 'CORNFLAKES', 'COFFEE'})
frozenset({'BREAD', 'MILK', 'MAGGI', 'JAM'})
frozenset({'BREAD', 'MAGGI', 'JAM', 'TEA'})
frozenset({'MILK', 'TEA', 'CORNFLAKES', 'COFFEE'})
```