In [11]:

```
import pandas as pd
import numpy as np
from mlxtend.preprocessing import TransactionEncoder
from mlxtend.frequent_patterns import apriori,  association_rules
```

In [12]:

```
df = pd.read_csv('customer.csv')
```

In [13]:

```
backup_df = df
```

In [14]:

```
df.head()
```

Out[14]:

	CustomerID	Gender	Age	Annual Income ($)	Spending Score (1-100)	Profession	Work Experience	Family Size	Graduate
0	1	Male	19	15000	39	Healthcare	1	4	Ye
1	2	Male	21	35000	81	Engineer	3	3	Ye
2	3	Female	20	86000	6	Engineer	1	1	N
3	4	Female	23	59000	77	Lawyer	0	2	N
4	5	Female	31	38000	40	Entertainment	2	6	N

In [15]:

```
df.drop(['Profession', 'Graduated','Gender'], axis=1, inplace=True)
df.head()
```

Out[15]:

	CustomerID	Age	Annual Income ($)	Spending Score (1-100)	Work Experience	Family Size
0	1	19	15000	39	1	4
1	2	21	35000	81	3	3
2	3	20	86000	6	1	1
3	4	23	59000	77	0	2
4	5	31	38000	40	2	6

In [16]:

```
arr = df.to_numpy()
print(arr)
arr = np.transpose(arr)
print(arr)
arr = arr[1:]
print(arr)
```

```
[[     1     19  15000     39      1      4]
 [     2     21  35000     81      3      3]
 [     3     20  86000      6      1      1]
 ...
 [  1998     87  90961     14      9      2]
 [  1999     77 182109      4      7      2]
 [  2000     90 110610     52      5      2]]
[[     1      2      3 ...   1998   1999   2000]
 [    19     21     20 ...     87     77     90]
 [ 15000  35000  86000 ...  90961 182109 110610]
 [    39     81      6 ...     14      4     52]
 [     1      3      1 ...      9      7      5]
 [     4      3      1 ...      2      2      2]]
[[    19     21     20 ...     87     77     90]
 [ 15000  35000  86000 ...  90961 182109 110610]
 [    39     81      6 ...     14      4     52]
 [     1      3      1 ...      9      7      5]
 [     4      3      1 ...      2      2      2]]
```

In [17]:

```
# Encoding
tr = TransactionEncoder()
tr_arr = tr.fit(arr).transform(arr)
df = pd.DataFrame(tr_arr, columns = tr.columns_)
df.head()
```

Out[17]:

	0	1	2	3	4	5	6	7	8	9	...	189369	189446	18
0	True	True	True	True	True	True	True	True	True	True	...	False	False	F
1	True	False	False	False	False	False	False	False	False	False	...	True	True	
2	True	True	True	True	True	True	True	True	True	True	...	False	False	F
3	True	True	True	True	True	True	True	True	True	True	...	False	False	F
4	False	True	True	True	True	True	True	True	True	True	...	False	False	F

5 rows × 1886 columns

In [18]:

```
#Applying Apriori
from mlxtend.frequent_patterns import apriori
frequent_itemsets = apriori(df, min_support = 0.5, use_colnames = True)
frequent_itemsets.head()
```

Out[18]:

	support	itemsets
0	0.8	(0)
1	0.8	(1)
2	0.8	(2)
3	0.8	(3)
4	0.8	(4)

In [ ]:

```

```