```python
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from mlxtend.frequent_patterns import apriori,association_rules
from mlxtend.preprocessing import TransactionEncoder

data = pd.read_csv('Downloads/titanic.csv')
data
```

	Class	Gender	Age	Survived
0	3rd	Male	Child	No
1	3rd	Male	Child	No
2	3rd	Male	Child	No
3	3rd	Male	Child	No
4	3rd	Male	Child	No
...	...	...	...	...
2196	Crew	Female	Adult	Yes
2197	Crew	Female	Adult	Yes
2198	Crew	Female	Adult	Yes
2199	Crew	Female	Adult	Yes
2200	Crew	Female	Adult	Yes

2201 rows × 4 columns

```python
df=pd.get_dummies(data)
df
```

	Class_1st	Class_2nd	Class_3rd	Class_Crew	Gender_Female	Gender_Male	Age_Adult	Age_Child	Survived_No	Survived_Yes
0	0	0	1	0	0	1	0	1	1	0
1	0	0	1	0	0	1	0	1	1	0
2	0	0	1	0	0	1	0	1	1	0
3	0	0	1	0	0	1	0	1	1	0
4	0	0	1	0	0	1	0	1	1	0
...	...	...	...	...	...	...	...	...	...	...
2196	0	0	0	1	1	0	1	0	0	1
2197	0	0	0	1	1	0	1	0	0	1
2198	0	0	0	1	1	0	1	0	0	1
2199	0	0	0	1	1	0	1	0	0	1
2200	0	0	0	1	1	0	1	0	0	1

2201 rows × 10 columns

```python
data1 = apriori(df,min_support=0.3,use_colnames=True)
data1
```

	support	itemsets
0	0.320763	(Class_3rd)
1	0.402090	(Class_Crew)
2	0.786461	(Gender_Male)
3	0.950477	(Age_Adult)
4	0.676965	(Survived_No)
5	0.323035	(Survived_Yes)
6	0.391640	(Class_Crew, Gender_Male)
7	0.402090	(Class_Crew, Age_Adult)
8	0.305770	(Class_Crew, Survived_No)
9	0.757383	(Gender_Male, Age_Adult)
10	0.619718	(Gender_Male, Survived_No)
11	0.653339	(Survived_No, Age_Adult)
12	0.391640	(Class_Crew, Gender_Male, Age_Adult)
13	0.304407	(Class_Crew, Gender_Male, Survived_No)
14	0.305770	(Class_Crew, Survived_No, Age_Adult)
15	0.603816	(Gender_Male, Survived_No, Age_Adult)
16	0.304407	(Class_Crew, Gender_Male, Survived_No, Age_Adult)

```
data2 = association_rules(data1,metric='lift',min_threshold=0.6)
data2
```

	antecedents	consequents	antecedent support	consequent support	support	confidence	lift	leverage	conviction
0	(Class_Crew)	(Gender_Male)	0.402090	0.786461	0.391640	0.974011	1.238474	0.075412	8.216621
1	(Gender_Male)	(Class_Crew)	0.786461	0.402090	0.391640	0.497978	1.238474	0.075412	1.191004
2	(Class_Crew)	(Age_Adult)	0.402090	0.950477	0.402090	1.000000	1.052103	0.019913	inf
3	(Age_Adult)	(Class_Crew)	0.950477	0.402090	0.402090	0.423040	1.052103	0.019913	1.036311
4	(Class_Crew)	(Survived_No)	0.402090	0.676965	0.305770	0.760452	1.123325	0.033569	1.348519
5	(Survived_No)	(Class_Crew)	0.676965	0.402090	0.305770	0.451678	1.123325	0.033569	1.090436
6	(Gender_Male)	(Age_Adult)	0.786461	0.950477	0.757383	0.963027	1.013204	0.009870	1.339441
7	(Age_Adult)	(Gender_Male)	0.950477	0.786461	0.757383	0.796845	1.013204	0.009870	1.051116
8	(Gender_Male)	(Survived_No)	0.786461	0.676965	0.619718	0.787984	1.163995	0.087312	1.523634
9	(Survived_No)	(Gender_Male)	0.676965	0.786461	0.619718	0.915436	1.163995	0.087312	2.525187
10	(Survived_No)	(Age_Adult)	0.676965	0.950477	0.653339	0.965101	1.015386	0.009900	1.419023
11	(Age_Adult)	(Survived_No)	0.950477	0.676965	0.653339	0.687380	1.015386	0.009900	1.033317
12	(Class_Crew, Gender_Male)	(Age_Adult)	0.391640	0.950477	0.391640	1.000000	1.052103	0.019395	inf
13	(Class_Crew, Age_Adult)	(Gender_Male)	0.402090	0.786461	0.391640	0.974011	1.238474	0.075412	8.216621
14	(Gender_Male, Age_Adult)	(Class_Crew)	0.757383	0.402090	0.391640	0.517097	1.286022	0.087104	1.238157

```
data2.sort_values('lift',ascending=True)
```

	antecedents	consequents	antecedent support	consequent support	support	confidence	lift	leverage	conviction
6	(Gender_Male)	(Age_Adult)	0.786461	0.950477	0.757383	0.963027	1.013204	0.009870	1.339441
7	(Age_Adult)	(Gender_Male)	0.950477	0.786461	0.757383	0.796845	1.013204	0.009870	1.051116
11	(Age_Adult)	(Survived_No)	0.950477	0.676965	0.653339	0.687380	1.015386	0.009900	1.033317
10	(Survived_No)	(Age_Adult)	0.676965	0.950477	0.653339	0.965101	1.015386	0.009900	1.419023
35	(Age_Adult)	(Gender_Male, Survived_No)	0.950477	0.619718	0.603816	0.635277	1.025106	0.014788	1.042660
30	(Gender_Male, Survived_No)	(Age_Adult)	0.619718	0.950477	0.603816	0.974340	1.025106	0.014788	1.929980
24	(Class_Crew, Survived_No)	(Age_Adult)	0.305770	0.950477	0.305770	1.000000	1.052103	0.015143	inf
36	(Class_Crew, Gender_Male, Survived_No)	(Age_Adult)	0.304407	0.950477	0.304407	1.000000	1.052103	0.015075	inf
29	(Age_Adult)	(Class_Crew, Survived_No)	0.950477	0.305770	0.305770	0.321702	1.052103	0.015143	1.023488
17	(Age_Adult)	(Class_Crew, Gender_Male)	0.950477	0.391640	0.391640	0.412046	1.052103	0.019395	1.034706
12	(Class_Crew, Gender_Male)	(Age_Adult)	0.391640	0.950477	0.391640	1.000000	1.052103	0.019395	inf
49	(Age_Adult)	(Class_Crew, Gender_Male, Survived_No)	0.950477	0.304407	0.304407	0.320268	1.052103	0.015075	1.023334
3	(Age_Adult)	(Class_Crew)	0.950477	0.402090	0.402090	0.423040	1.052103	0.019913	1.036311