

ARM_v1

December 6, 2022

```
[1]: import pandas as pd
import numpy as np
from tqdm.notebook import tqdm
import nltk
import string
from nltk.stem import WordNetLemmatizer
from nltk.stem import PorterStemmer
from nltk.corpus import stopwords
from nltk.tokenize import word_tokenize
from nltk.sentiment import SentimentIntensityAnalyzer
from nltk.downloader import download

from nltk.sentiment import SentimentAnalyzer
from vaderSentiment.vaderSentiment import SentimentIntensityAnalyzer
import nltk
from nltk.corpus import state_union
from nltk.tokenize import PunktSentenceTokenizer
from nltk.corpus import subjectivity

import os
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
from apyori import apriori
import networkx as nx

download('vader_lexicon')
download('stopwords')
download('wordnet')
download('punkt')
download('omw-1.4')
```

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[nltk_data] Downloading package vader_lexicon to
[nltk_data] /Users/chenqian/nltk_data...
[nltk_data] Package vader_lexicon is already up-to-date!
[nltk_data] Downloading package stopwords to
[nltk_data] /Users/chenqian/nltk_data...
[nltk_data] Package stopwords is already up-to-date!
```

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[nltk_data] Downloading package wordnet to
[nltk_data]    /Users/chenqian/nltk_data...
[nltk_data] Package wordnet is already up-to-date!
[nltk_data] Downloading package punkt to /Users/chenqian/nltk_data...
[nltk_data] Package punkt is already up-to-date!
[nltk_data] Downloading package omw-1.4 to
[nltk_data]    /Users/chenqian/nltk_data...
[nltk_data] Package omw-1.4 is already up-to-date!

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[1]: True
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[2]: df = pd.read_csv("R_cleaned_data.csv")
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[3]: def target_encode(age,gender):
    if age<=40 and gender=='Male':
        return 'Young men'
    elif age>40 and gender=='Male':
        return 'Old men'
    elif age<=40 and gender=='Female':
        return 'Young women'
    else:
        return 'Old women'
```

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[4]: df['Age_normalized'] = df['Age'].apply(lambda x: sum(map(int,(x.split('-'))))/2)
df['Age'] = df.apply(lambda x: target_encode(x.Age_normalized,x.Gender),axis=1)
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[5]: list(df)[:9]
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[5]: ['Age',
      'Gender',
      'AMITRIPTYLINE',
      'BUPROPION',
      'CITALOPRAM',
      'DESVENLAFAXINE',
      'DOXEPIN',
      'DULOXETINE',
      'ESCITALOPRAM',
      'FLUOXETINE',
      'MIRTAZAPINE',
      'NORTRIPTYLINE',
      'PAROXETINE',
      'ROPINIROLE',
      'SERTRALINE',
      'TRAZODONE',
      'VENLAFAXINE']
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[6]: df = df[list(df)[:9]]
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[7]: for col in list(df)[2:]:
      df[col] = np.where(df[col].isnull(),float('nan'),col)

[8]: transactions = []
      for i in tqdm(range(len(df))):
          transactions.append([str(df.values[i,j]) for j in range(0, df.shape[1])])

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[9]: transactions_small = transactions[:]

[10]: # Training ARM - Apriori on the dataset
      from apyori import apriori
      rules = apriori(transactions_small, min_support = 0.02, min_confidence = 0.2,
      ↪min_lift = 3, min_length = 2)

[11]: # Visualising the results
      results = list(rules)

[12]: results

[12]: [RelationRecord(items=frozenset({'PAROXETINE', 'DULOXETINE'}),
support=0.020691711389385806,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'PAROXETINE'}), confidence=0.26109857035364936,
lift=3.297155892191792), OrderedStatistic(items_base=frozenset({'PAROXETINE'}),
items_add=frozenset({'DULOXETINE'}), confidence=0.26129518072289154,
lift=3.2971558921917916)]),
RelationRecord(items=frozenset({'TRAZODONE', 'DULOXETINE'}),
support=0.023076923076923078,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'TRAZODONE'}), confidence=0.29119638826185107,
lift=3.240453504413565), OrderedStatistic(items_base=frozenset({'TRAZODONE'}),
items_add=frozenset({'DULOXETINE'}), confidence=0.25680159256801594,
lift=3.2404535044135647)]),
RelationRecord(items=frozenset({'VENLAFAXINE', 'DULOXETINE'}),
support=0.029278473464519977,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.3694507148231754,
lift=3.71221599016456), OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'DULOXETINE'}), confidence=0.29418813660874776,
lift=3.7122159901645597)]),
RelationRecord(items=frozenset({'Old men', 'Male'}),
support=0.18038163387000597,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'Male'}),
items_add=frozenset({'Old men'}), confidence=0.7074368568755847,
lift=3.921889616463985), OrderedStatistic(items_base=frozenset({'Old men'}),

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items_add=frozenset({'Male'}), confidence=1.0, lift=3.9218896164639854))),
  RelationRecord(items=frozenset({'Young men', 'Male'}),
support=0.07459749552772808,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'Male'}),
items_add=frozenset({'Young men'}), confidence=0.29256314312441534,
lift=3.921889616463985), OrderedStatistic(items_base=frozenset({'Young men'}),
items_add=frozenset({'Male'}), confidence=1.0, lift=3.9218896164639854)]),
  RelationRecord(items=frozenset({'PAROXETINE', 'VENLAFAXINE'}),
support=0.023732856290995825,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'PAROXETINE'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.2996987951807229,
lift=3.0113533823731116),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'PAROXETINE'}), confidence=0.23846614739364888,
lift=3.011353382373111)]),
  RelationRecord(items=frozenset({'DULOXETINE', 'CITALOPRAM', 'BUPROPION'}),
support=0.020274299344066785,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'CITALOPRAM', 'BUPROPION'}),
confidence=0.25583145221971404, lift=7.259379786336048),
OrderedStatistic(items_base=frozenset({'CITALOPRAM', 'BUPROPION'}),
items_add=frozenset({'DULOXETINE'}), confidence=0.5752961082910321,
lift=7.259379786336048), OrderedStatistic(items_base=frozenset({'DULOXETINE',
'BUPROPION'}), items_add=frozenset({'CITALOPRAM'}),
confidence=0.7172995780590717, lift=4.84263845573697),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'CITALOPRAM'}),
items_add=frozenset({'BUPROPION'}), confidence=0.6706114398422091,
lift=4.277730637563273)]),
  RelationRecord(items=frozenset({'ESCITALOPRAM', 'CITALOPRAM', 'BUPROPION'}),
support=0.02653548002385212,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'CITALOPRAM',
'BUPROPION'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.7529610829103215, lift=4.0523611554576675),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'BUPROPION'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.5433455433455434,
lift=3.6682386320067484), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'CITALOPRAM'}), items_add=frozenset({'BUPROPION'}),
confidence=0.49334811529933487, lift=3.146994253925388)]),
  RelationRecord(items=frozenset({'CITALOPRAM', 'BUPROPION', 'FLUOXETINE'}),
support=0.026475849731663684,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'CITALOPRAM',
'BUPROPION'}), items_add=frozenset({'FLUOXETINE'}),
confidence=0.7512690355329948, lift=5.0801539217291625),
OrderedStatistic(items_base=frozenset({'BUPROPION', 'FLUOXETINE'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.6597325408618128,
lift=4.453991429248228), OrderedStatistic(items_base=frozenset({'CITALOPRAM',
'FLUOXETINE'}), items_add=frozenset({'BUPROPION'}),

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confidence=0.5598991172761665, lift=3.5715131976878327))],
  RelationRecord(items=frozenset({'SERTRALINE', 'CITALOPRAM', 'BUPROPION'}),
support=0.0283840190816935,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'CITALOPRAM',
'BUPROPION'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.8054145516074449, lift=3.887968344978944),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'BUPROPION'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.675177304964539,
lift=4.558262240038373), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'CITALOPRAM'}), items_add=frozenset({'BUPROPION'}),
confidence=0.47269116186693144, lift=3.0152266202010045))],
  RelationRecord(items=frozenset({'VENLAFAXINE', 'CITALOPRAM', 'BUPROPION'}),
support=0.02283840190816935,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'CITALOPRAM', 'BUPROPION'}),
confidence=0.22947872977831038, lift=6.511604565790634),
OrderedStatistic(items_base=frozenset({'CITALOPRAM', 'BUPROPION'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.6480541455160744,
lift=6.511604565790634), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'BUPROPION'}), items_add=frozenset({'CITALOPRAM'}),
confidence=0.6754850088183421, lift=4.5603396126745555),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'CITALOPRAM'}),
items_add=frozenset({'BUPROPION'}), confidence=0.606973058637084,
lift=3.8717908685218325))],
  RelationRecord(items=frozenset({'ESCITALOPRAM', 'DULOXETINE', 'BUPROPION'}),
support=0.022659511031604056,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'BUPROPION'}),
confidence=0.28592927012791575, lift=5.854742197857322),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'BUPROPION'}),
items_add=frozenset({'ESCITALOPRAM'}), confidence=0.8016877637130803,
lift=4.314603272615005), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'BUPROPION'}), items_add=frozenset({'DULOXETINE'}),
confidence=0.463980463980464, lift=5.854742197857322),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'DULOXETINE'}),
items_add=frozenset({'BUPROPION'}), confidence=0.6846846846846847,
lift=4.367501773359514))],
  RelationRecord(items=frozenset({'DULOXETINE', 'BUPROPION', 'FLUOXETINE'}),
support=0.021407274895646988,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'BUPROPION', 'FLUOXETINE'}),
confidence=0.27012791572610984, lift=6.731122060515396),
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items_add=frozenset({'FLUOXETINE'}), confidence=0.7573839662447257,
lift=5.121503674969375), OrderedStatistic(items_base=frozenset({'BUPROPION',
'FLUOXETINE'}), items_add=frozenset({'DULOXETINE'}),
confidence=0.5334323922734027, lift=6.731122060515397),

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OrderedStatistic(items_base=frozenset({'DULOXETINE', 'FLUOXETINE'}),
items_add=frozenset({'BUPROPION'}), confidence=0.7123015873015872,
lift=4.543665887808147)),
RelationRecord(items=frozenset({'SERTRALINE', 'DULOXETINE', 'BUPROPION'}),
support=0.021705426356589147,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'SERTRALINE', 'BUPROPION'}), confidence=0.2738901429646351,
lift=6.515088932648129), OrderedStatistic(items_base=frozenset({'DULOXETINE',
'BUPROPION'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.7679324894514767, lift=3.7070316200636917),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'BUPROPION'}),
items_add=frozenset({'DULOXETINE'}), confidence=0.5163120567375886,
lift=6.515088932648127), OrderedStatistic(items_base=frozenset({'SERTRALINE',
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confidence=0.6691176470588235, lift=4.2682019555635105)]),
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'VENLAFAXINE', 'BUPROPION'}),
confidence=0.26109857035364936, lift=7.722439197232275),
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items_add=frozenset({'DULOXETINE', 'BUPROPION'}), confidence=0.2079089275014979,
lift=7.3557652198314765), OrderedStatistic(items_base=frozenset({'DULOXETINE',
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confidence=0.7320675105485231, lift=7.3557652198314765),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'BUPROPION'}),
items_add=frozenset({'DULOXETINE'}), confidence=0.6119929453262786,
lift=7.722439197232274), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'DULOXETINE'}), items_add=frozenset({'BUPROPION'}),
confidence=0.7067209775967412, lift=4.508068008481305)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'BUPROPION', 'FLUOXETINE'}),
support=0.02999403697078116,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'FLUOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'BUPROPION'}),
confidence=0.2028225806451613, lift=4.153033794162827),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'BUPROPION'}),
items_add=frozenset({'FLUOXETINE'}), confidence=0.6141636141636142,
lift=4.153033794162827), OrderedStatistic(items_base=frozenset({'BUPROPION',
'FLUOXETINE'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.7473997028231798, lift=4.022430364680592),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'FLUOXETINE'}),
items_add=frozenset({'BUPROPION'}), confidence=0.5869311551925321,
lift=3.743946547196183)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'SERTRALINE', 'BUPROPION'}),
support=0.03142516398330352,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'BUPROPION'}),
items_add=frozenset({'ESCITALOPRAM', 'SERTRALINE'}),

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confidence=0.20045644731837203, lift=3.241711303306749),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'BUPROPION'}),
items_add=frozenset({'SERTRALINE'}), confidence=0.6434676434676435,
lift=3.106203909312718), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'BUPROPION'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.747517730496454, lift=4.023065577800235),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'SERTRALINE'}),
items_add=frozenset({'BUPROPION'}), confidence=0.5081967213114754,
lift=3.241711303306749)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'TRAZODONE', 'BUPROPION'}),
support=0.023017292784734644,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'TRAZODONE'}),
items_add=frozenset({'ESCITALOPRAM', 'BUPROPION'}),
confidence=0.2561380225613802, lift=5.244730938161594),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'BUPROPION'}),
items_add=frozenset({'TRAZODONE'}), confidence=0.4713064713064713,
lift=5.244730938161595), OrderedStatistic(items_base=frozenset({'TRAZODONE',
'BUPROPION'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.7296786389413987, lift=3.9270573732500824),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'TRAZODONE'}),
items_add=frozenset({'BUPROPION'}), confidence=0.731060606060606,
lift=4.66332687852277)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'VENLAFAXINE', 'BUPROPION'}),
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'ESCITALOPRAM', 'BUPROPION'}),
confidence=0.2504493708807669, lift=5.1282490227966555),
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items_add=frozenset({'VENLAFAXINE'}), confidence=0.5103785103785103,
lift=5.1282490227966555), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'BUPROPION'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.7372134038800705, lift=3.9676087237062845),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'VENLAFAXINE'}),
items_add=frozenset({'BUPROPION'}), confidence=0.6342943854324734,
lift=4.04606954876477)]),
RelationRecord(items=frozenset({'SERTRALINE', 'BUPROPION', 'FLUOXETINE'}),
support=0.02999403697078116,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'FLUOXETINE'}),
items_add=frozenset({'SERTRALINE', 'BUPROPION'}), confidence=0.2028225806451613,
lift=4.824588194921071), OrderedStatistic(items_base=frozenset({'BUPROPION',
'FLUOXETINE'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.7473997028231798, lift=3.607913936771654),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'BUPROPION'}),
items_add=frozenset({'FLUOXETINE'}), confidence=0.7134751773049646,
lift=4.824588194921071), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'FLUOXETINE'}), items_add=frozenset({'BUPROPION'}),
confidence=0.5174897119341564, lift=3.300989908381819)]),

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RelationRecord(items=frozenset({'VENLAFAXINE', 'BUPROPION', 'FLUOXETINE'}),
support=0.024329159212880144,
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items_add=frozenset({'BUPROPION', 'FLUOXETINE'}),
confidence=0.24445775913720794, lift=6.091466004057915),
OrderedStatistic(items_base=frozenset({'BUPROPION', 'FLUOXETINE'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.6062407132243685,
lift=6.0914660040579145), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'BUPROPION'}), items_add=frozenset({'FLUOXETINE'}),
confidence=0.7195767195767195, lift=4.86584741423451),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'FLUOXETINE'}),
items_add=frozenset({'BUPROPION'}), confidence=0.6634146341463415,
lift=4.231823284379668)]),
RelationRecord(items=frozenset({'Male', 'Old men', 'BUPROPION'}),
support=0.030530709600477043,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'Male',
'BUPROPION'}), items_add=frozenset({'Old men'}), confidence=0.6305418719211823,
lift=3.4955990717746204), OrderedStatistic(items_base=frozenset({'Old men',
'BUPROPION'}), items_add=frozenset({'Male'}), confidence=1.0,
lift=3.9218896164639854)]),
RelationRecord(items=frozenset({'TRAZODONE', 'SERTRALINE', 'BUPROPION'}),
support=0.020512820512820513,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'TRAZODONE'}),
items_add=frozenset({'SERTRALINE', 'BUPROPION'}),
confidence=0.22826808228268083, lift=5.429866297702919),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'BUPROPION'}),
items_add=frozenset({'TRAZODONE'}), confidence=0.48794326241134756,
lift=5.429866297702919), OrderedStatistic(items_base=frozenset({'TRAZODONE',
'BUPROPION'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.6502835538752363, lift=3.1391062747517884),
OrderedStatistic(items_base=frozenset({'TRAZODONE', 'SERTRALINE'}),
items_add=frozenset({'BUPROPION'}), confidence=0.6602687140115163,
lift=4.211755927718953)]),
RelationRecord(items=frozenset({'SERTRALINE', 'VENLAFAXINE', 'BUPROPION'}),
support=0.024150268336314847,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'SERTRALINE', 'BUPROPION'}), confidence=0.2426602756141402,
lift=5.772216768864016), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'BUPROPION'}), items_add=frozenset({'VENLAFAXINE'}),
confidence=0.574468085106383, lift=5.772216768864016),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'BUPROPION'}),
items_add=frozenset({'SERTRALINE'}), confidence=0.7142857142857142,
lift=3.4480631630890692), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'VENLAFAXINE'}), items_add=frozenset({'BUPROPION'}),
confidence=0.6164383561643835, lift=3.932168593714991)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'DULOXETINE', 'CITALOPRAM'}),
support=0.025462134764460347,

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ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
confidence=0.32129420617005267, lift=5.973507580345658),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'CITALOPRAM'}),
items_add=frozenset({'ESCITALOPRAM'}), confidence=0.8422090729783038,
lift=4.532684901747803), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'CITALOPRAM'}), items_add=frozenset({'DULOXETINE'}),
confidence=0.4733924611973393, lift=5.973507580345658),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'DULOXETINE'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.7693693693693694,
lift=5.194172433302868))],
RelationRecord(items=frozenset({'DULOXETINE', 'CITALOPRAM', 'FLUOXETINE'}),
support=0.025044722719141325,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'CITALOPRAM', 'FLUOXETINE'}),
confidence=0.3160270880361174, lift=6.683195796173631),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'CITALOPRAM'}),
items_add=frozenset({'FLUOXETINE'}), confidence=0.8284023668639053,
lift=5.601736972704715), OrderedStatistic(items_base=frozenset({'CITALOPRAM',
'FLUOXETINE'}), items_add=frozenset({'DULOXETINE'}),
confidence=0.5296343001261035, lift=6.683195796173631),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'FLUOXETINE'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.8333333333333334,
lift=5.626006441223833))],
RelationRecord(items=frozenset({'DULOXETINE', 'SERTRALINE', 'CITALOPRAM'}),
support=0.02701252236135957,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'SERTRALINE', 'CITALOPRAM'}),
confidence=0.3408577878103838, lift=5.676449951916719),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'CITALOPRAM'}),
items_add=frozenset({'SERTRALINE'}), confidence=0.893491124260355,
lift=4.3131393649528365), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'CITALOPRAM'}), items_add=frozenset({'DULOXETINE'}),
confidence=0.44985104270109233, lift=5.676449951916719),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'DULOXETINE'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.8327205882352942,
lift=5.621869671781757))],
RelationRecord(items=frozenset({'DULOXETINE', 'CITALOPRAM', 'VENLAFAXINE'}),
support=0.024150268336314847,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'VENLAFAXINE', 'CITALOPRAM'}),
confidence=0.3047404063205418, lift=8.099043762274936),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'DULOXETINE', 'CITALOPRAM'}),
confidence=0.2426602756141402, lift=8.026455270313868),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'CITALOPRAM'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.7988165680473372,

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lift=8.026455270313868), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
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confidence=0.6418383518225039, lift=8.099043762274936),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'DULOXETINE'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.8248472505091649,
lift=5.5687151332683955))),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'CITALOPRAM', 'FLUOXETINE'}),
support=0.03732856290995826,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'CITALOPRAM'}),
items_add=frozenset({'ESCITALOPRAM', 'FLUOXETINE'}),
confidence=0.25201288244766507, lift=4.931453954080914),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM'}),
items_add=frozenset({'CITALOPRAM', 'FLUOXETINE'}),
confidence=0.20089858793324775, lift=4.248511121867042),
OrderedStatistic(items_base=frozenset({'FLUOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
confidence=0.25241935483870964, lift=4.692985122666475),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
items_add=frozenset({'FLUOXETINE'}), confidence=0.6940133037694013,
lift=4.692985122666475), OrderedStatistic(items_base=frozenset({'CITALOPRAM',
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confidence=0.7894073139974779, lift=4.248511121867042),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'FLUOXETINE'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.7304550758459744,
lift=4.931453954080913)]),
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items_add=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
confidence=0.3200301204819277, lift=5.950005676809233),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
items_add=frozenset({'PAROXETINE'}), confidence=0.47117516629711753,
lift=5.950005676809233), OrderedStatistic(items_base=frozenset({'PAROXETINE',
'CITALOPRAM'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.8517034068136272, lift=4.583782455797346),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'PAROXETINE'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.7456140350877193,
lift=5.033795236884481)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'SERTRALINE', 'CITALOPRAM'}),
support=0.04335122242098986,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'CITALOPRAM'}),
items_add=frozenset({'ESCITALOPRAM', 'SERTRALINE'}),
confidence=0.29267310789049916, lift=4.733006768875286),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM'}),
items_add=frozenset({'SERTRALINE', 'CITALOPRAM'}),
confidence=0.23331193838254172, lift=3.8854431049406397),
OrderedStatistic(items_base=frozenset({'SERTRALINE'}),

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items_add=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
confidence=0.20926885434657455, lift=3.8907302520976224),
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items_add=frozenset({'SERTRALINE'}), confidence=0.8059866962305987,
lift=3.8907302520976224), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'CITALOPRAM'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.7219463753723933, lift=3.88544310494064),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'SERTRALINE'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.7010607521697203,
lift=4.733006768875286))),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'TRAZODONE', 'CITALOPRAM'}),
support=0.021168753726893263,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'TRAZODONE'}),
items_add=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
confidence=0.23556735235567353, lift=4.379672393574995),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
items_add=frozenset({'TRAZODONE'}), confidence=0.393569844789357,
lift=4.379672393574995), OrderedStatistic(items_base=frozenset({'TRAZODONE',
'CITALOPRAM'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.7836644591611479, lift=4.217603652160607),
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items_add=frozenset({'CITALOPRAM'}), confidence=0.6723484848484849,
lift=4.539164287805592)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'VENLAFAXINE', 'CITALOPRAM'}),
support=0.030948121645796065,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'CITALOPRAM'}),
items_add=frozenset({'ESCITALOPRAM', 'VENLAFAXINE'}),
confidence=0.20893719806763283, lift=5.3169602603857395),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
confidence=0.310964649490713, lift=5.781460279333988),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.5753880266075388,
lift=5.781460279333989), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'CITALOPRAM'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.8225039619651346, lift=4.426633967315567),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'VENLAFAXINE'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.787556904400607,
lift=5.31696026038574)]),
RelationRecord(items=frozenset({'PAROXETINE', 'CITALOPRAM', 'FLUOXETINE'}),
support=0.024150268336314847,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'PAROXETINE'}),
items_add=frozenset({'CITALOPRAM', 'FLUOXETINE'}),
confidence=0.3049698795180723, lift=6.449363025873988),
OrderedStatistic(items_base=frozenset({'CITALOPRAM', 'FLUOXETINE'}),
items_add=frozenset({'PAROXETINE'}), confidence=0.510718789407314,
lift=6.449363025873987), OrderedStatistic(items_base=frozenset({'PAROXETINE',

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'CITALOPRAM'})), items_add=frozenset({'FLUOXETINE'}),
confidence=0.8116232464929859, lift=5.488274936970715),
OrderedStatistic(items_base=frozenset({'PAROXETINE', 'FLUOXETINE'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.8940397350993377,
lift=6.035847970054707)]),
RelationRecord(items=frozenset({'SERTRALINE', 'CITALOPRAM', 'FLUOXETINE'}),
support=0.04245676803816339,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'CITALOPRAM'}),
items_add=frozenset({'SERTRALINE', 'FLUOXETINE'}), confidence=0.286634460547504,
lift=4.945329118705393), OrderedStatistic(items_base=frozenset({'FLUOXETINE'}),
items_add=frozenset({'SERTRALINE', 'CITALOPRAM'}),
confidence=0.2870967741935484, lift=4.781144889002787),
OrderedStatistic(items_base=frozenset({'SERTRALINE'}),
items_add=frozenset({'CITALOPRAM', 'FLUOXETINE'}), confidence=0.204951065054692,
lift=4.334211047877913), OrderedStatistic(items_base=frozenset({'CITALOPRAM',
'FLUOXETINE'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.8978562421185372, lift=4.334211047877913),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'CITALOPRAM'}),
items_add=frozenset({'FLUOXETINE'}), confidence=0.7070506454816285,
lift=4.781144889002786), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'FLUOXETINE'}), items_add=frozenset({'CITALOPRAM'}),
confidence=0.7325102880658436, lift=4.945329118705393)]),
RelationRecord(items=frozenset({'TRAZODONE', 'CITALOPRAM', 'FLUOXETINE'}),
support=0.020274299344066785,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'TRAZODONE'}),
items_add=frozenset({'CITALOPRAM', 'FLUOXETINE'}), confidence=0.225613802256138,
lift=4.771177129678984), OrderedStatistic(items_base=frozenset({'CITALOPRAM',
'FLUOXETINE'}), items_add=frozenset({'TRAZODONE'}),
confidence=0.4287515762925599, lift=4.771177129678985),
OrderedStatistic(items_base=frozenset({'TRAZODONE', 'CITALOPRAM'}),
items_add=frozenset({'FLUOXETINE'}), confidence=0.7505518763796909,
lift=5.075304422132023), OrderedStatistic(items_base=frozenset({'TRAZODONE',
'FLUOXETINE'}), items_add=frozenset({'CITALOPRAM'}),
confidence=0.7391304347826086, lift=4.9900231043898335)]),
RelationRecord(items=frozenset({'VENLAFAXINE', 'CITALOPRAM', 'FLUOXETINE'}),
support=0.02981514609421586,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'CITALOPRAM'}),
items_add=frozenset({'VENLAFAXINE', 'FLUOXETINE'}),
confidence=0.20128824476650564, lift=5.488786771925691),
OrderedStatistic(items_base=frozenset({'FLUOXETINE'}),
items_add=frozenset({'VENLAFAXINE', 'CITALOPRAM'}),
confidence=0.20161290322580644, lift=5.358238331373651),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'CITALOPRAM', 'FLUOXETINE'}),
confidence=0.2995805871779509, lift=6.335392745238633),
OrderedStatistic(items_base=frozenset({'CITALOPRAM', 'FLUOXETINE'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.6305170239596469,

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lift=6.335392745238633), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'CITALOPRAM'}), items_add=frozenset({'FLUOXETINE'}),
confidence=0.7923930269413628, lift=5.35823833137365),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'FLUOXETINE'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.8130081300813009,
lift=5.488786771925691))),
RelationRecord(items=frozenset({'Old men', 'CITALOPRAM', 'Male'}),
support=0.027787716159809184,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'CITALOPRAM',
'Male'}), items_add=frozenset({'Old men'}), confidence=0.6714697406340059,
lift=3.7224950579941414), OrderedStatistic(items_base=frozenset({'Old men',
'CITALOPRAM'}), items_add=frozenset({'Male'}), confidence=1.0,
lift=3.9218896164639854)]),
RelationRecord(items=frozenset({'PAROXETINE', 'CITALOPRAM', 'SERTRALINE'}),
support=0.025402504472271915,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'PAROXETINE'}),
items_add=frozenset({'SERTRALINE', 'CITALOPRAM'}),
confidence=0.32078313253012053, lift=5.342138165372513),
OrderedStatistic(items_base=frozenset({'PAROXETINE', 'CITALOPRAM'}),
items_add=frozenset({'SERTRALINE'}), confidence=0.8537074148296594,
lift=4.121091924782207), OrderedStatistic(items_base=frozenset({'SERTRALINE',
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confidence=0.423038728897716, lift=5.342138165372513),
OrderedStatistic(items_base=frozenset({'PAROXETINE', 'SERTRALINE'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.8658536585365854,
lift=5.84555791210086)]),
RelationRecord(items=frozenset({'VENLAFAXINE', 'PAROXETINE', 'CITALOPRAM'}),
support=0.021347644603458556,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'PAROXETINE'}),
items_add=frozenset({'VENLAFAXINE', 'CITALOPRAM'}),
confidence=0.26957831325301207, lift=7.16454566284154),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'PAROXETINE', 'CITALOPRAM'}),
confidence=0.21449970041941283, lift=7.208737426920948),
OrderedStatistic(items_base=frozenset({'PAROXETINE', 'CITALOPRAM'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.7174348697394789,
lift=7.208737426920948), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'CITALOPRAM'}), items_add=frozenset({'PAROXETINE'}),
confidence=0.5673534072900158, lift=7.16454566284154),
OrderedStatistic(items_base=frozenset({'PAROXETINE', 'VENLAFAXINE'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.8994974874371859,
lift=6.072694389823513)]),
RelationRecord(items=frozenset({'TRAZODONE', 'SERTRALINE', 'CITALOPRAM'}),
support=0.02224209898628503,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'TRAZODONE'}),
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confidence=0.2475116124751161, lift=4.121916326919262),

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OrderedStatistic(items_base=frozenset({'SERTRALINE', 'CITALOPRAM'}),
items_add=frozenset({'TRAZODONE'}), confidence=0.3704071499503475,
lift=4.121916326919262), OrderedStatistic(items_base=frozenset({'TRAZODONE',
'CITALOPRAM'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.8233995584988961, lift=3.9747871606293863),
OrderedStatistic(items_base=frozenset({'TRAZODONE', 'SERTRALINE'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.7159309021113244,
lift=4.8333982400994)]),
RelationRecord(items=frozenset({'VENLAFAXINE', 'SERTRALINE', 'CITALOPRAM'}),
support=0.03261776982707215,
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items_add=frozenset({'SERTRALINE', 'VENLAFAXINE'}),
confidence=0.22020933977455714, lift=5.620868535798056),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'SERTRALINE', 'CITALOPRAM'}),
confidence=0.32774116237267825, lift=5.458013200585714),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'CITALOPRAM'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.5431976166832174,
lift=5.458013200585714), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'CITALOPRAM'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.8668779714738509, lift=4.184670000465308),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'VENLAFAXINE'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.8325722983257229,
lift=5.620868535798056)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'DULOXETINE', 'FLUOXETINE'}),
support=0.02599880739415623,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'FLUOXETINE'}),
confidence=0.32806621519939805, lift=6.419685447950881),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'DULOXETINE'}),
items_add=frozenset({'FLUOXETINE'}), confidence=0.7855855855855856,
lift=5.312205754141238), OrderedStatistic(items_base=frozenset({'DULOXETINE',
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confidence=0.865079365079365, lift=4.655770523870652),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'FLUOXETINE'}),
items_add=frozenset({'DULOXETINE'}), confidence=0.5087514585764294,
lift=6.419685447950882)]),
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items_add=frozenset({'ESCITALOPRAM', 'SERTRALINE'}),
confidence=0.344620015048909, lift=5.573073917425462),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'DULOXETINE'}),
items_add=frozenset({'SERTRALINE'}), confidence=0.8252252252252252,
lift=3.983600180491372), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'DULOXETINE'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.8419117647058824, lift=4.531084818394624),

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OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'SERTRALINE'}),
items_add=frozenset({'DULOXETINE'}), confidence=0.4416586306653809,
lift=5.573073917425462)),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'VENLAFAXINE', 'DULOXETINE'}),
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'VENLAFAXINE'}),
confidence=0.3054928517682468, lift=7.774074543480271),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'ESCITALOPRAM', 'DULOXETINE'}),
confidence=0.24325943678849613, lift=7.35037973863618),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'DULOXETINE'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.7315315315315315,
lift=7.35037973863618), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
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confidence=0.8268839103869654, lift=4.450206411164766),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'VENLAFAXINE'}),
items_add=frozenset({'DULOXETINE'}), confidence=0.6160849772382397,
lift=7.774074543480271))],
RelationRecord(items=frozenset({'SERTRALINE', 'DULOXETINE', 'FLUOXETINE'}),
support=0.026416219439475253,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'SERTRALINE', 'FLUOXETINE'}),
confidence=0.3333333333333333, lift=5.751028806584362),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'FLUOXETINE'}),
items_add=frozenset({'SERTRALINE'}), confidence=0.878968253968254,
lift=4.243033281245716), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'DULOXETINE'}), items_add=frozenset({'FLUOXETINE'}),
confidence=0.8143382352941176, lift=5.506633953984819),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'FLUOXETINE'}),
items_add=frozenset({'DULOXETINE'}), confidence=0.45576131687242794,
lift=5.751028806584362))],
RelationRecord(items=frozenset({'VENLAFAXINE', 'DULOXETINE', 'FLUOXETINE'}),
support=0.023732856290995825,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'VENLAFAXINE', 'FLUOXETINE'}),
confidence=0.29947328818660646, lift=8.166125272990879),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'DULOXETINE', 'FLUOXETINE'}),
confidence=0.23846614739364888, lift=7.93467716625296),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'FLUOXETINE'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.7896825396825397,
lift=7.9346771662529605), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'DULOXETINE'}), items_add=frozenset({'FLUOXETINE'}),
confidence=0.810590631364562, lift=5.4812922935418165),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'FLUOXETINE'}),
items_add=frozenset({'DULOXETINE'}), confidence=0.6471544715447155,

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lift=8.16612527299088))],
  RelationRecord(items=frozenset({'Female', 'DULOXETINE', 'VENLAFAXINE'}),
support=0.021168753726893263,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'VENLAFAXINE', 'Female'}), confidence=0.2671181339352897,
lift=3.5836568848758468),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'DULOXETINE', 'Female'}), confidence=0.21270221689634514,
lift=3.5073905382022694), OrderedStatistic(items_base=frozenset({'Female',
'DULOXETINE'}), items_add=frozenset({'VENLAFAXINE'}),
confidence=0.3490658800393314, lift=3.50739053820227),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'Female'}),
items_add=frozenset({'DULOXETINE'}), confidence=0.28400000000000003,
lift=3.583656884875847))],
  RelationRecord(items=frozenset({'VENLAFAXINE', 'SERTRALINE', 'DULOXETINE'}),
support=0.024686940966010734,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'SERTRALINE', 'VENLAFAXINE'}),
confidence=0.31151241534988716, lift=7.951389962583877),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'SERTRALINE', 'DULOXETINE'}),
confidence=0.24805272618334334, lift=7.646772459732845),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'DULOXETINE'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.7610294117647058,
lift=7.646772459732844), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'DULOXETINE'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.8431771894093686, lift=4.0702594894631865),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'VENLAFAXINE'}),
items_add=frozenset({'DULOXETINE'}), confidence=0.6301369863013698,
lift=7.951389962583877))],
  RelationRecord(items=frozenset({'TRAZODONE', 'DULOXETINE', 'nan'}),
support=0.021645796064400716,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'TRAZODONE', 'nan'}), confidence=0.27313769751693,
lift=3.0886845498037196), OrderedStatistic(items_base=frozenset({'TRAZODONE'}),
items_add=frozenset({'DULOXETINE', 'nan'}), confidence=0.24087591240875914,
lift=3.095393908884974), OrderedStatistic(items_base=frozenset({'DULOXETINE',
'nan'}), items_add=frozenset({'TRAZODONE'}), confidence=0.2781609195402299,
lift=3.095393908884974), OrderedStatistic(items_base=frozenset({'TRAZODONE',
'nan'}), items_add=frozenset({'DULOXETINE'}), confidence=0.2447741065407957,
lift=3.08868454980372))],
  RelationRecord(items=frozenset({'VENLAFAXINE', 'DULOXETINE', 'nan'}),
support=0.027847346451997615,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'VENLAFAXINE', 'nan'}), confidence=0.3513920240782543,
lift=3.5822761360439666),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),

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items_add=frozenset({'DULOXETINE', 'nan'}), confidence=0.27980826842420614,
lift=3.595697058600718), OrderedStatistic(items_base=frozenset({'DULOXETINE',
'nan'}), items_add=frozenset({'VENLAFAXINE'}), confidence=0.3578544061302682,
lift=3.595697058600718), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'nan'}), items_add=frozenset({'DULOXETINE'}), confidence=0.2838905775075988,
lift=3.5822761360439666))),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'PAROXETINE', 'FLUOXETINE'}),
support=0.023971377459749553,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'PAROXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'FLUOXETINE'}),
confidence=0.30271084337349397, lift=5.923524904753202),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'FLUOXETINE'}),
items_add=frozenset({'PAROXETINE'}), confidence=0.4690781796966161,
lift=5.923524904753202), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'PAROXETINE'}), items_add=frozenset({'FLUOXETINE'}),
confidence=0.7052631578947368, lift=4.7690577249575545),
OrderedStatistic(items_base=frozenset({'PAROXETINE', 'FLUOXETINE'}),
items_add=frozenset({'ESCITALOPRAM'}), confidence=0.8874172185430463,
lift=4.775990614559335)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'SERTRALINE', 'FLUOXETINE'}),
support=0.042814549791293975,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ESCITALOPRAM'}),
items_add=frozenset({'SERTRALINE', 'FLUOXETINE'}),
confidence=0.23042362002567393, lift=3.9755186294553),
OrderedStatistic(items_base=frozenset({'FLUOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'SERTRALINE'}),
confidence=0.28951612903225804, lift=4.681953214918965),
OrderedStatistic(items_base=frozenset({'SERTRALINE'}),
items_add=frozenset({'ESCITALOPRAM', 'FLUOXETINE'}),
confidence=0.206678180771445, lift=4.044332662237028),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'FLUOXETINE'}),
items_add=frozenset({'SERTRALINE'}), confidence=0.837806301050175,
lift=4.044332662237028), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'SERTRALINE'}), items_add=frozenset({'FLUOXETINE'}),
confidence=0.6923818707810993, lift=4.681953214918965),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'FLUOXETINE'}),
items_add=frozenset({'ESCITALOPRAM'}), confidence=0.7386831275720164,
lift=3.9755186294553)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'TRAZODONE', 'FLUOXETINE'}),
support=0.021288014311270125,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'TRAZODONE'}),
items_add=frozenset({'ESCITALOPRAM', 'FLUOXETINE'}),
confidence=0.23689449236894491, lift=4.6356133454226445),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'FLUOXETINE'}),
items_add=frozenset({'TRAZODONE'}), confidence=0.41656942823803966,
lift=4.6356133454226445), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'TRAZODONE'}), items_add=frozenset({'FLUOXETINE'}),

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confidence=0.6761363636363635, lift=4.57209952346041),
OrderedStatistic(items_base=frozenset({'TRAZODONE', 'FLUOXETINE'}),
items_add=frozenset({'ESCITALOPRAM'}), confidence=0.7760869565217391,
lift=4.176822291678294))),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'VENLAFAXINE', 'FLUOXETINE'}),
support=0.02975551580202743,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'FLUOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'VENLAFAXINE'}),
confidence=0.20120967741935483, lift=5.120313035390866),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'ESCITALOPRAM', 'FLUOXETINE'}),
confidence=0.298981426003595, lift=5.850546690875483),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'FLUOXETINE'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.5822637106184364,
lift=5.850546690875482), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'VENLAFAXINE'}), items_add=frozenset({'FLUOXETINE'}),
confidence=0.7572078907435508, lift=5.120313035390866),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'FLUOXETINE'}),
items_add=frozenset({'ESCITALOPRAM'}), confidence=0.8113821138211382,
lift=4.366777294217101)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'Old men', 'Male'}),
support=0.03178294573643411,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'Male'}), items_add=frozenset({'Old men'}), confidence=0.6056818181818182,
lift=3.357779864763336), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'Old men'}), items_add=frozenset({'Male'}), confidence=1.0,
lift=3.9218896164639854)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'Young men', 'Male'}),
support=0.020691711389385806,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'Young men'}),
items_add=frozenset({'ESCITALOPRAM', 'Male'}), confidence=0.2773780975219824,
lift=5.28594397209505), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'Male'}), items_add=frozenset({'Young men'}), confidence=0.3943181818181818,
lift=5.285943972095051), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'Young men'}), items_add=frozenset({'Male'}), confidence=1.0,
lift=3.9218896164639854)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'PAROXETINE', 'SERTRALINE'}),
support=0.024806201550387597,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'PAROXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'SERTRALINE'}),
confidence=0.3132530120481928, lift=5.065817755109154),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'PAROXETINE'}),
items_add=frozenset({'SERTRALINE'}), confidence=0.7298245614035087,
lift=3.523073659970305), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'SERTRALINE'}), items_add=frozenset({'PAROXETINE'}),
confidence=0.40115718418514945, lift=5.065817755109154),
OrderedStatistic(items_base=frozenset({'PAROXETINE', 'SERTRALINE'}),

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items_add=frozenset({'ESCITALOPRAM'}), confidence=0.8455284552845528,
lift=4.550549484955696))),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'PAROXETINE', 'VENLAFAXINE'}),
support=0.02110912343470483,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'PAROXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'VENLAFAXINE'}),
confidence=0.266566265060241, lift=6.783484468983675),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'ESCITALOPRAM', 'PAROXETINE'}),
confidence=0.21210305572198923, lift=6.240295165715367),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'PAROXETINE'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.6210526315789474,
lift=6.240295165715367), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'VENLAFAXINE'}), items_add=frozenset({'PAROXETINE'}),
confidence=0.5371775417298938, lift=6.783484468983675),
OrderedStatistic(items_base=frozenset({'PAROXETINE', 'VENLAFAXINE'}),
items_add=frozenset({'ESCITALOPRAM'}), confidence=0.8894472361809046,
lift=4.786915966223932)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'TRAZODONE', 'SERTRALINE'}),
support=0.0234943351222421,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'TRAZODONE'}),
items_add=frozenset({'ESCITALOPRAM', 'SERTRALINE'}),
confidence=0.26144658261446585, lift=4.228022363013107),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'SERTRALINE'}),
items_add=frozenset({'TRAZODONE'}), confidence=0.3799421407907425,
lift=4.228022363013107), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'TRAZODONE'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.7462121212121212, lift=3.6021811378028996),
OrderedStatistic(items_base=frozenset({'TRAZODONE', 'SERTRALINE'}),
items_add=frozenset({'ESCITALOPRAM'}), confidence=0.7562380038387716,
lift=4.069997215781836)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'SERTRALINE', 'VENLAFAXINE'}),
support=0.032081097197376264,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'ESCITALOPRAM', 'SERTRALINE'}),
confidence=0.32234871180347513, lift=5.212910218846941),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'SERTRALINE'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.5188042430086788,
lift=5.2129102188469405), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'VENLAFAXINE'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.8163884673748102, lift=3.940942601576156),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'VENLAFAXINE'}),
items_add=frozenset({'ESCITALOPRAM'}), confidence=0.8188736681887365,
lift=4.40709608970639)]),
RelationRecord(items=frozenset({'PAROXETINE', 'SERTRALINE', 'FLUOXETINE'}),
support=0.024269528920691712,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'PAROXETINE'}),

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items_add=frozenset({'SERTRALINE', 'FLUOXETINE'}),
confidence=0.30647590361445787, lift=5.287655250632159),
OrderedStatistic(items_base=frozenset({'PAROXETINE', 'FLUOXETINE'}),
items_add=frozenset({'SERTRALINE'}), confidence=0.8984547461368654,
lift=4.337100199399894), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'FLUOXETINE'}), items_add=frozenset({'PAROXETINE'}),
confidence=0.41872427983539096, lift=5.287655250632159),
OrderedStatistic(items_base=frozenset({'PAROXETINE', 'SERTRALINE'}),
items_add=frozenset({'FLUOXETINE'}), confidence=0.8272357723577236,
lift=5.593848347757671))),
RelationRecord(items=frozenset({'PAROXETINE', 'VENLAFAXINE', 'FLUOXETINE'}),
support=0.020512820512820513,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'PAROXETINE'}),
items_add=frozenset({'VENLAFAXINE', 'FLUOXETINE'}),
confidence=0.25903614457831325, lift=7.063473405818396),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'PAROXETINE', 'FLUOXETINE'}),
confidence=0.2061114439784302, lift=7.630218356552482),
OrderedStatistic(items_base=frozenset({'PAROXETINE', 'FLUOXETINE'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.7593818984547461,
lift=7.630218356552483), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'FLUOXETINE'}), items_add=frozenset({'PAROXETINE'}),
confidence=0.559349593495935, lift=7.063473405818397),
OrderedStatistic(items_base=frozenset({'PAROXETINE', 'VENLAFAXINE'}),
items_add=frozenset({'FLUOXETINE'}), confidence=0.8643216080402011,
lift=5.844626357594424)]),
RelationRecord(items=frozenset({'TRAZODONE', 'SERTRALINE', 'FLUOXETINE'}),
support=0.02182468694096601,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'TRAZODONE'}),
items_add=frozenset({'SERTRALINE', 'FLUOXETINE'}),
confidence=0.24286662242866622, lift=4.1901988252353215),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'FLUOXETINE'}),
items_add=frozenset({'TRAZODONE'}), confidence=0.37654320987654316,
lift=4.1901988252353215), OrderedStatistic(items_base=frozenset({'TRAZODONE',
'FLUOXETINE'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.7956521739130434, lift=3.8408425321018247),
OrderedStatistic(items_base=frozenset({'TRAZODONE', 'SERTRALINE'}),
items_add=frozenset({'FLUOXETINE'}), confidence=0.7024952015355086,
lift=4.750340536189709)]),
RelationRecord(items=frozenset({'SERTRALINE', 'VENLAFAXINE', 'FLUOXETINE'}),
support=0.03130590339892665,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'FLUOXETINE'}),
items_add=frozenset({'SERTRALINE', 'VENLAFAXINE'}),
confidence=0.21169354838709675, lift=5.4035019885108255),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'SERTRALINE', 'FLUOXETINE'}),
confidence=0.3145596165368484, lift=5.427124248274637),

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OrderedStatistic(items_base=frozenset({'SERTRALINE', 'FLUOXETINE'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.5401234567901234,
lift=5.427124248274637), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'FLUOXETINE'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.8536585365853658, lift=4.120855975399132),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'VENLAFAXINE'}),
items_add=frozenset({'FLUOXETINE'}), confidence=0.7990867579908675,
lift=5.4035019885108255)],
RelationRecord(items=frozenset({'Old men', 'SERTRALINE', 'Male'}),
support=0.03530113297555158,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'SERTRALINE',
'Male'}), items_add=frozenset({'Old men'}), confidence=0.6115702479338843,
lift=3.3904241513557816), OrderedStatistic(items_base=frozenset({'Old men',
'SERTRALINE'}), items_add=frozenset({'Male'}), confidence=1.0,
lift=3.9218896164639854)]),
RelationRecord(items=frozenset({'TRAZODONE', 'Old men', 'Male'}),
support=0.02182468694096601,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'TRAZODONE',
'Male'}), items_add=frozenset({'Old men'}), confidence=0.7561983471074379,
lift=4.192213646608837), OrderedStatistic(items_base=frozenset({'TRAZODONE',
'Old men'}), items_add=frozenset({'Male'}), confidence=1.0,
lift=3.9218896164639854)]),
RelationRecord(items=frozenset({'Old men', 'Male', 'nan'}),
support=0.17990459153249852,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'Male'}),
items_add=frozenset({'Old men', 'nan'}), confidence=0.7055659494855006,
lift=3.9218896164639854), OrderedStatistic(items_base=frozenset({'Old men'}),
items_add=frozenset({'Male', 'nan'}), confidence=0.9973553719008265,
lift=3.9197678900344175), OrderedStatistic(items_base=frozenset({'Male',
'nan'}), items_add=frozenset({'Old men'}), confidence=0.7070541363955941,
lift=3.9197678900344175), OrderedStatistic(items_base=frozenset({'Old men',
'nan'}), items_add=frozenset({'Male'}), confidence=1.0,
lift=3.9218896164639854)]),
RelationRecord(items=frozenset({'SERTRALINE', 'Male', 'Young men'}),
support=0.022420989862850328,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'Young men'}),
items_add=frozenset({'SERTRALINE', 'Male'}), confidence=0.30055955235811355,
lift=5.20700794736112), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'Male'}), items_add=frozenset({'Young men'}), confidence=0.3884297520661157,
lift=5.207007947361119), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'Young men'}), items_add=frozenset({'Male'}), confidence=1.0,
lift=3.9218896164639854)]),
RelationRecord(items=frozenset({'Young men', 'Male', 'nan'}),
support=0.07453786523553965,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'Male'}),
items_add=frozenset({'Young men', 'nan'}), confidence=0.2923292797006548,
lift=3.921889616463985), OrderedStatistic(items_base=frozenset({'Young men'}),

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items_add=frozenset({'Male', 'nan'}), confidence=0.9992006394884093,
lift=3.927020090044674), OrderedStatistic(items_base=frozenset({'Male', 'nan'}),
items_add=frozenset({'Young men'}), confidence=0.2929458636044059,
lift=3.9270200900446737), OrderedStatistic(items_base=frozenset({'Young men',
'nan'}), items_add=frozenset({'Male'}), confidence=1.0,
lift=3.9218896164639854))),
RelationRecord(items=frozenset({'PAROXETINE', 'VENLAFAXINE', 'SERTRALINE'}),
support=0.021049493142516397,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'PAROXETINE'}),
items_add=frozenset({'SERTRALINE', 'VENLAFAXINE'}),
confidence=0.26581325301204817, lift=6.784913627111183),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'PAROXETINE', 'SERTRALINE'}),
confidence=0.2115038945476333, lift=7.209187625129696),
OrderedStatistic(items_base=frozenset({'PAROXETINE', 'SERTRALINE'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.7174796747967479,
lift=7.2091876251296965), OrderedStatistic(items_base=frozenset({'PAROXETINE',
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confidence=0.8869346733668342, lift=4.2814894854236645),
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items_add=frozenset({'PAROXETINE'}), confidence=0.5372907153729071,
lift=6.784913627111184)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'CITALOPRAM', 'BUPROPION',
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confidence=0.6598984771573604, lift=12.913065883230962),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'BUPROPION'}),
items_add=frozenset({'CITALOPRAM', 'FLUOXETINE'}),
confidence=0.47619047619047616, lift=10.070257611241217),
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items_add=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
confidence=0.5794947994056463, lift=10.773977589836685),
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items_add=frozenset({'BUPROPION', 'FLUOXETINE'}),
confidence=0.43237250554323725, lift=10.773977589836685),
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items_add=frozenset({'ESCITALOPRAM', 'BUPROPION'}),
confidence=0.4918032786885246, lift=10.070257611241217),
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items_add=frozenset({'CITALOPRAM', 'BUPROPION'}),
confidence=0.45507584597432904, lift=12.91306588323096),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'CITALOPRAM',
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confidence=0.8764044943820224, lift=5.926332004349401),
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confidence=0.8783783783783784, lift=4.727344481837422),
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confidence=0.7753479125248508, lift=5.234534820065115),
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confidence=0.6230031948881789, lift=3.974044723573511)]),
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confidence=0.688663282571912, lift=11.136820876307583),
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items_add=frozenset({'SERTRALINE', 'CITALOPRAM'}),
confidence=0.49694749694749696, lift=8.275878375183241),
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items_add=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
confidence=0.5773049645390071, lift=10.733264141152052),
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lift=10.733264141152052), OrderedStatistic(items_base=frozenset({'SERTRALINE',
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confidence=0.4041708043694141, lift=8.275878375183241),
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items_add=frozenset({'CITALOPRAM', 'BUPROPION'}),
confidence=0.39247830279652846, lift=11.136820876307583),
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confidence=0.9146067415730337, lift=4.415070540063263),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'CITALOPRAM',
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confidence=0.8550420168067228, lift=4.60175052049061),
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'BUPROPION'}), items_add=frozenset({'CITALOPRAM'}),
confidence=0.7722960151802656, lift=5.213930827122807),
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confidence=0.5598349381017882, lift=3.5711038082795694)]),
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confidence=0.20311563810665068, lift=7.6544926989854645),
OrderedStatistic(items_base=frozenset({'CITALOPRAM', 'BUPROPION'}),
items_add=frozenset({'ESCITALOPRAM', 'VENLAFAXINE'}),
confidence=0.5736040609137055, lift=14.596874205649229),
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items_add=frozenset({'VENLAFAXINE', 'CITALOPRAM'}),
confidence=0.4139194139194139, lift=11.00067919402309),
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items_add=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
confidence=0.5978835978835978, lift=11.115862457325871),
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items_add=frozenset({'VENLAFAXINE', 'BUPROPION'}),
confidence=0.37583148558758317, lift=11.115862457325871),
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confidence=0.537242472266244, lift=11.00067919402309),
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items_add=frozenset({'CITALOPRAM', 'BUPROPION'}), confidence=0.5144157814871017,
lift=14.596874205649229), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
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confidence=0.7617977528089886, lift=7.6544926989854645),
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confidence=0.8851174934725848, lift=4.763613724497833),
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confidence=0.8110047846889953, lift=5.475261771028362),
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confidence=0.653179190751445, lift=4.166532913237631)]),
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confidence=0.7123519458544839, lift=3.863564725737288),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'BUPROPION'}),
items_add=frozenset({'CITALOPRAM', 'nan'}), confidence=0.5140415140415141,
lift=3.504258614014712), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
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confidence=0.4667405764966741, lift=3.0046984521494142),
OrderedStatistic(items_base=frozenset({'CITALOPRAM', 'BUPROPION', 'nan'}),
items_add=frozenset({'ESCITALOPRAM'}), confidence=0.7425044091710759,
lift=3.9960843844027414), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
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confidence=0.529559748427673, lift=3.5751678668003524),
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items_add=frozenset({'BUPROPION'}), confidence=0.47949886104783596,
lift=3.0586519207958194)]),
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confidence=0.7072758037225041, lift=12.202690564224685),
OrderedStatistic(items_base=frozenset({'BUPROPION', 'FLUOXETINE'}),
items_add=frozenset({'SERTRALINE', 'CITALOPRAM'}),
confidence=0.6210995542347696, lift=10.3434354761838),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'BUPROPION'}),
items_add=frozenset({'CITALOPRAM', 'FLUOXETINE'}),
confidence=0.5929078014184397, lift=12.538542029996512),
OrderedStatistic(items_base=frozenset({'CITALOPRAM', 'FLUOXETINE'}),
items_add=frozenset({'SERTRALINE', 'BUPROPION'}), confidence=0.5271122320302648,
lift=12.538542029996512), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'CITALOPRAM'}), items_add=frozenset({'BUPROPION', 'FLUOXETINE'}),
confidence=0.4150943396226415, lift=10.3434354761838),
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items_add=frozenset({'CITALOPRAM', 'BUPROPION'}),
confidence=0.43004115226337447, lift=12.202690564224685),
OrderedStatistic(items_base=frozenset({'CITALOPRAM', 'BUPROPION',
'FLUOXETINE'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.9414414414414415, lift=4.544609376215594),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'CITALOPRAM',
'BUPROPION'}), items_add=frozenset({'FLUOXETINE'}),
confidence=0.8781512605042017, lift=5.93814380590946),
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'FLUOXETINE'}), items_add=frozenset({'CITALOPRAM'}),
confidence=0.831013916500994, lift=5.6103475763774835),
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'FLUOXETINE'}), items_add=frozenset({'BUPROPION'}),
confidence=0.5870786516853932, lift=3.7448874053876167)]),
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items_add=frozenset({'VENLAFAXINE', 'FLUOXETINE'}),
confidence=0.5820642978003383, lift=15.87189963270191),
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items_add=frozenset({'VENLAFAXINE', 'CITALOPRAM'}),
confidence=0.5111441307578009, lift=13.584607088444248),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'BUPROPION'}),
items_add=frozenset({'CITALOPRAM', 'FLUOXETINE'}),
confidence=0.6067019400352733, lift=12.83025414172955),
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items_add=frozenset({'VENLAFAXINE', 'BUPROPION'}),
confidence=0.4337957124842371, lift=12.83025414172955),
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items_add=frozenset({'BUPROPION', 'FLUOXETINE'}), confidence=0.5451664025356576,
lift=13.584607088444248), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',

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'FLUOXETINE'})), items_add=frozenset({'CITALOPRAM', 'BUPROPION'}),
confidence=0.559349593495935, lift=15.871899632701911),
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confidence=0.7747747747747749, lift=7.78488494486098),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'CITALOPRAM',
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confidence=0.8981723237597912, lift=6.073528173166007),
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confidence=0.8431372549019608, lift=5.692194752297054),
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'FLUOXETINE'}), items_add=frozenset({'BUPROPION'}),
confidence=0.6880000000000001, lift=4.3886496766831495)]),
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confidence=0.7106598984771573, lift=4.852510788868863),
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items_add=frozenset({'CITALOPRAM', 'nan'}), confidence=0.6240713224368499,
lift=4.254339868807307), OrderedStatistic(items_base=frozenset({'CITALOPRAM',
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confidence=0.5296343001261035, lift=3.409584342846355),
OrderedStatistic(items_base=frozenset({'CITALOPRAM', 'BUPROPION', 'nan'}),
items_add=frozenset({'FLUOXETINE'}), confidence=0.7407407407407407,
lift=5.008960573476702), OrderedStatistic(items_base=frozenset({'BUPROPION',
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confidence=0.6471494607087828, lift=4.369040441258569),
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items_add=frozenset({'BUPROPION'}), confidence=0.5461638491547465,
lift=3.4838979651293642)]),
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confidence=0.2097064110245656, lift=7.388185951432701),
OrderedStatistic(items_base=frozenset({'CITALOPRAM', 'BUPROPION'}),
items_add=frozenset({'SERTRALINE', 'VENLAFAXINE'}),
confidence=0.5922165820642977, lift=15.116395861823854),
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confidence=0.4964539007092199, lift=13.19418686987895),
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items_add=frozenset({'SERTRALINE', 'CITALOPRAM'}),
confidence=0.6172839506172839, lift=10.279892603626466),
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items_add=frozenset({'VENLAFAXINE', 'BUPROPION'}),
confidence=0.3475670307845084, lift=10.279892603626465),
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items_add=frozenset({'SERTRALINE', 'BUPROPION'}), confidence=0.554675118858954,
lift=13.19418686987895), OrderedStatistic(items_base=frozenset({'SERTRALINE',
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confidence=0.532724505327245, lift=15.116395861823856),
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confidence=0.9138381201044387, lift=4.411360182542152),
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confidence=0.8641975308641976, lift=5.834377050158049),
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confidence=0.6398537477148081, lift=4.081531893943451)]),
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confidence=0.7648054145516074, lift=3.717619362907379),
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items_add=frozenset({'CITALOPRAM', 'nan'}), confidence=0.6411347517730497,
lift=4.37066251513579), OrderedStatistic(items_base=frozenset({'CITALOPRAM',
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confidence=0.7971781305114638, lift=3.848208764731505),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'BUPROPION', 'nan'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.6637298091042585,
lift=4.480977817503388)]),
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confidence=0.21509886159376873, lift=6.361918710630514),
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lift=6.192615678953295), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
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confidence=0.6331569664902997, lift=4.316277369122897),
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items_add=frozenset({'BUPROPION', 'nan'}), confidence=0.5689381933438985,
lift=3.66260787039431), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
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items_add=frozenset({'BUPROPION'}), confidence=0.5914332784184514,
lift=3.7726649216726624))),
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confidence=0.26787057938299474, lift=5.650552976418644),
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items_add=frozenset({'ESCITALOPRAM'}), confidence=0.7911111111111112,
lift=4.2576807873341895), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
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RelationRecord(items=frozenset({'SERTRALINE', 'DULOXETINE', 'BUPROPION',
'nan'}), support=0.020274299344066785,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'SERTRALINE', 'BUPROPION', 'nan'}),
confidence=0.25583145221971404, lift=6.2999903872608),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'BUPROPION'}),
items_add=frozenset({'SERTRALINE', 'nan'}), confidence=0.7172995780590717,
lift=3.4866996881306185), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'BUPROPION'}), items_add=frozenset({'DULOXETINE', 'nan'}),
confidence=0.48226950354609927, lift=6.197440286948725),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'DULOXETINE'}),
items_add=frozenset({'BUPROPION', 'nan'}), confidence=0.625,
lift=4.023512476007677), OrderedStatistic(items_base=frozenset({'DULOXETINE',
'nan'}), items_add=frozenset({'SERTRALINE', 'BUPROPION'}),
confidence=0.26053639846743293, lift=6.197440286948724),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'BUPROPION', 'nan'}),

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items_add=frozenset({'SERTRALINE'}), confidence=0.7555555555555555,
lift=3.6472845902897717), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'BUPROPION', 'nan'}), items_add=frozenset({'DULOXETINE'}),
confidence=0.49926578560939794, lift=6.2999903872608005),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'DULOXETINE', 'nan'}),
items_add=frozenset({'BUPROPION'}), confidence=0.6538461538461539,
lift=4.170787371624192))),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'Female', 'BUPROPION',
'FLUOXETINE'}), support=0.020691711389385806,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'BUPROPION'}), items_add=frozenset({'Female', 'FLUOXETINE'}),
confidence=0.4236874236874237, lift=3.7006448412698414),
OrderedStatistic(items_base=frozenset({'BUPROPION', 'FLUOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'Female'}), confidence=0.5156017830609212,
lift=3.867013372956909), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'FLUOXETINE'}), items_add=frozenset({'Female', 'BUPROPION'}),
confidence=0.40490081680280043, lift=3.7370317544210034),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'Female', 'BUPROPION'}),
items_add=frozenset({'FLUOXETINE'}), confidence=0.6263537906137183,
lift=4.235464947012925), OrderedStatistic(items_base=frozenset({'Female',
'BUPROPION', 'FLUOXETINE'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.7289915966386554, lift=3.9233597803691436),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'Female', 'FLUOXETINE'}),
items_add=frozenset({'BUPROPION'}), confidence=0.5688524590163934,
lift=3.6286252330562636)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'SERTRALINE', 'BUPROPION',
'FLUOXETINE'}), support=0.02623732856290996,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'BUPROPION'}), items_add=frozenset({'SERTRALINE', 'FLUOXETINE'}),
confidence=0.5372405372405372, lift=9.269057417205564),
OrderedStatistic(items_base=frozenset({'BUPROPION', 'FLUOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'SERTRALINE'}),
confidence=0.6537890044576523, lift=10.572846291952583),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'BUPROPION'}),
items_add=frozenset({'ESCITALOPRAM', 'FLUOXETINE'}),
confidence=0.624113475177305, lift=12.212815611112491),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'FLUOXETINE'}),
items_add=frozenset({'SERTRALINE', 'BUPROPION'}), confidence=0.5134189031505251,
lift=12.212815611112491), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'SERTRALINE'}), items_add=frozenset({'BUPROPION', 'FLUOXETINE'}),
confidence=0.42430086788813887, lift=10.572846291952583),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'FLUOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'BUPROPION'}),
confidence=0.45267489711934156, lift=9.269057417205566),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'BUPROPION',
'FLUOXETINE'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.8747514910536779, lift=4.222677750423195),

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OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'SERTRALINE',
'BUPROPION'}), items_add=frozenset({'FLUOXETINE'}),
confidence=0.8349146110056925, lift=5.645773397808655),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'BUPROPION',
'FLUOXETINE'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.8747514910536779, lift=4.707824937410199),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'SERTRALINE',
'FLUOXETINE'}), items_add=frozenset({'BUPROPION'}),
confidence=0.6128133704735377, lift=3.9090453491218056)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'VENLAFAXINE', 'BUPROPION',
'FLUOXETINE'}), support=0.020930232558139535,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'ESCITALOPRAM', 'BUPROPION', 'FLUOXETINE'}),
confidence=0.21030557219892151, lift=7.011579415061458),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'BUPROPION'}),
items_add=frozenset({'VENLAFAXINE', 'FLUOXETINE'}),
confidence=0.42857142857142855, lift=11.686411149825783),
OrderedStatistic(items_base=frozenset({'BUPROPION', 'FLUOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'VENLAFAXINE'}),
confidence=0.5215453194650818, lift=13.27210168046953),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'BUPROPION'}),
items_add=frozenset({'ESCITALOPRAM', 'FLUOXETINE'}),
confidence=0.619047619047619, lift=12.113685614269043),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'FLUOXETINE'}),
items_add=frozenset({'VENLAFAXINE', 'BUPROPION'}),
confidence=0.40956826137689617, lift=12.113685614269045),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'VENLAFAXINE'}),
items_add=frozenset({'BUPROPION', 'FLUOXETINE'}), confidence=0.5326251896813353,
lift=13.272101680469529), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'FLUOXETINE'}), items_add=frozenset({'ESCITALOPRAM', 'BUPROPION'}),
confidence=0.5707317073170732, lift=11.686411149825785),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'BUPROPION',
'FLUOXETINE'}), items_add=frozenset({'VENLAFAXINE'}),
confidence=0.6978131212723657, lift=7.011579415061458),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'VENLAFAXINE',
'BUPROPION'}), items_add=frozenset({'FLUOXETINE'}),
confidence=0.8397129186602871, lift=5.678220018521377),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'BUPROPION',
'FLUOXETINE'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.8602941176470588, lift=4.6300168013290035),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'VENLAFAXINE',
'FLUOXETINE'}), items_add=frozenset({'BUPROPION'}),
confidence=0.7034068136272544, lift=4.486927449421475)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'BUPROPION', 'nan',
'FLUOXETINE'}), support=0.028562909958258796,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'BUPROPION'}), items_add=frozenset({'nan', 'FLUOXETINE'}),

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confidence=0.5848595848595849, lift=3.9935241197456186),
OrderedStatistic(items_base=frozenset({'BUPROPION', 'FLUOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'nan'}), confidence=0.711738484398217,
lift=3.860237510788518), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'FLUOXETINE'}), items_add=frozenset({'BUPROPION', 'nan'}),
confidence=0.5589264877479581, lift=3.5981563146000983),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'BUPROPION', 'nan'}),
items_add=frozenset({'FLUOXETINE'}), confidence=0.6025157232704403,
lift=4.074269628727937), OrderedStatistic(items_base=frozenset({'BUPROPION',
'nan', 'FLUOXETINE'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.7380585516178737, lift=3.972157224207876),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'nan', 'FLUOXETINE'}),
items_add=frozenset({'BUPROPION'}), confidence=0.575030012004802,
lift=3.668030924808113))),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'SERTRALINE', 'Female',
'BUPROPION'}), support=0.020512820512820513,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'SERTRALINE',
'BUPROPION'}), items_add=frozenset({'ESCITALOPRAM', 'Female'}),
confidence=0.48794326241134756, lift=3.659574468085107),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'SERTRALINE'}),
items_add=frozenset({'Female', 'BUPROPION'}), confidence=0.33172613307618126,
lift=3.0616660713745514), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'Female', 'BUPROPION'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.7445887445887446, lift=4.007302068919527),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'SERTRALINE', 'Female'}),
items_add=frozenset({'BUPROPION'}), confidence=0.5, lift=3.189425637124382)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'SERTRALINE', 'VENLAFAXINE',
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items_add=frozenset({'ESCITALOPRAM', 'SERTRALINE', 'BUPROPION'}),
confidence=0.21330137807070104, lift=6.787597932154945),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'BUPROPION'}),
items_add=frozenset({'SERTRALINE', 'VENLAFAXINE'}),
confidence=0.4346764346764347, lift=11.09516561571356),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'BUPROPION'}),
items_add=frozenset({'ESCITALOPRAM', 'VENLAFAXINE'}),
confidence=0.5049645390070923, lift=12.850159816614472),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'BUPROPION'}),
items_add=frozenset({'ESCITALOPRAM', 'SERTRALINE'}),
confidence=0.6278659611992945, lift=10.15362793569158),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'SERTRALINE'}),
items_add=frozenset({'VENLAFAXINE', 'BUPROPION'}), confidence=0.343297974927676,
lift=10.153627935691581), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'VENLAFAXINE'}), items_add=frozenset({'SERTRALINE', 'BUPROPION'}),
confidence=0.5402124430955993, lift=12.85015981661447),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'VENLAFAXINE'}),
items_add=frozenset({'ESCITALOPRAM', 'BUPROPION'}),

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confidence=0.5418569254185692, lift=11.09516561571356),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'SERTRALINE',
'BUPROPION'}), items_add=frozenset({'VENLAFAXINE'}),
confidence=0.6755218216318785, lift=6.787597932154944),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'VENLAFAXINE',
'BUPROPION'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.8516746411483255, lift=4.111279139912901),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'VENLAFAXINE',
'BUPROPION'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.8790123456790124, lift=4.730756430371322),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'SERTRALINE',
'VENLAFAXINE'}), items_add=frozenset({'BUPROPION'}),
confidence=0.6617100371747213, lift=4.2209499138151685)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'SERTRALINE', 'BUPROPION',
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confidence=0.7134751773049646, lift=3.869656766948336),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'SERTRALINE'}),
items_add=frozenset({'BUPROPION', 'nan'}), confidence=0.48505303760848606,
lift=3.1225871173490636), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'BUPROPION', 'nan'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.6327044025157234, lift=3.054246640814243),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'BUPROPION', 'nan'}),
items_add=frozenset({'ESCITALOPRAM'}), confidence=0.7386196769456682,
lift=3.975177144537502), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'SERTRALINE', 'nan'}), items_add=frozenset({'BUPROPION'}),
confidence=0.49654491609081935, lift=3.1673861707276685)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'TRAZODONE', 'BUPROPION',
'nan'}), support=0.021586165772212285,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'TRAZODONE'}),
items_add=frozenset({'ESCITALOPRAM', 'BUPROPION', 'nan'}),
confidence=0.24021234240212344, lift=5.0671207321806415),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'BUPROPION'}),
items_add=frozenset({'TRAZODONE', 'nan'}), confidence=0.44200244200244204,
lift=4.998233953055262), OrderedStatistic(items_base=frozenset({'TRAZODONE',
'BUPROPION'}), items_add=frozenset({'ESCITALOPRAM', 'nan'}),
confidence=0.6843100189035917, lift=3.711474455696388),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'TRAZODONE'}),
items_add=frozenset({'BUPROPION', 'nan'}), confidence=0.6856060606060606,
lift=4.413671261559936), OrderedStatistic(items_base=frozenset({'TRAZODONE',
'nan'}), items_add=frozenset({'ESCITALOPRAM', 'BUPROPION'}),
confidence=0.24409979770735, lift=4.998233953055262),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'BUPROPION', 'nan'}),
items_add=frozenset({'TRAZODONE'}), confidence=0.45534591194968554,
lift=5.0671207321806415), OrderedStatistic(items_base=frozenset({'TRAZODONE',
'BUPROPION', 'nan'}), items_add=frozenset({'ESCITALOPRAM'}),

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confidence=0.7168316831683168, lift=3.8579163436240926),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'TRAZODONE', 'nan'}),
items_add=frozenset({'BUPROPION'}), confidence=0.7182539682539683,
lift=4.581635240631057))),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'VENLAFAXINE', 'BUPROPION',
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items_add=frozenset({'ESCITALOPRAM', 'BUPROPION', 'nan'}),
confidence=0.23606950269622531, lift=4.979730264422263),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'BUPROPION'}),
items_add=frozenset({'VENLAFAXINE', 'nan'}), confidence=0.4810744810744811,
lift=4.904327688522217), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'BUPROPION'}), items_add=frozenset({'ESCITALOPRAM', 'nan'}),
confidence=0.6948853615520282, lift=3.768831666632442),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'VENLAFAXINE'}),
items_add=frozenset({'BUPROPION', 'nan'}), confidence=0.5978755690440061,
lift=3.8488956978379965), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
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confidence=0.23951367781155017, lift=4.904327688522218),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'BUPROPION', 'nan'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.4955974842767296,
lift=4.979730264422263), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'BUPROPION', 'nan'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.7255985267034991, lift=3.9050986177206934),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'VENLAFAXINE', 'nan'}),
items_add=frozenset({'BUPROPION'}), confidence=0.6204724409448819,
lift=3.9579014205575005))),
RelationRecord(items=frozenset({'SERTRALINE', 'Female', 'BUPROPION',
'FLUOXETINE'}), support=0.02039355992844365,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'BUPROPION',
'FLUOXETINE'}), items_add=frozenset({'SERTRALINE', 'Female'}),
confidence=0.5081723625557206, lift=3.4006586273182102),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'BUPROPION'}),
items_add=frozenset({'Female', 'FLUOXETINE'}), confidence=0.48510638297872344,
lift=4.237101063829788), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'FLUOXETINE'}), items_add=frozenset({'Female', 'BUPROPION'}),
confidence=0.35185185185185186, lift=3.2474163762000856),
OrderedStatistic(items_base=frozenset({'Female', 'BUPROPION', 'FLUOXETINE'}),
items_add=frozenset({'SERTRALINE'}), confidence=0.7184873949579833,
lift=3.4683458875778297), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'Female', 'BUPROPION'}), items_add=frozenset({'FLUOXETINE'}),
confidence=0.7402597402597403, lift=5.005708001675743),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'Female', 'FLUOXETINE'}),
items_add=frozenset({'BUPROPION'}), confidence=0.4878744650499287,
lift=3.112078653057172))),
RelationRecord(items=frozenset({'SERTRALINE', 'VENLAFAXINE', 'BUPROPION',
'FLUOXETINE'}), support=0.02110912343470483,

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ordered_statistics=[OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
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confidence=0.21210305572198923, lift=7.0715074442500185),
OrderedStatistic(items_base=frozenset({'BUPROPION', 'FLUOXETINE'}),
items_add=frozenset({'SERTRALINE', 'VENLAFAXINE'}),
confidence=0.5260029717682021, lift=13.426285900384702),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'BUPROPION'}),
items_add=frozenset({'VENLAFAXINE', 'FLUOXETINE'}),
confidence=0.5021276595744681, lift=13.692163985469644),
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items_add=frozenset({'SERTRALINE', 'FLUOXETINE'}),
confidence=0.6243386243386243, lift=10.771768240904043),
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items_add=frozenset({'VENLAFAXINE', 'BUPROPION'}),
confidence=0.36419753086419754, lift=10.771768240904043),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'FLUOXETINE'}),
items_add=frozenset({'SERTRALINE', 'BUPROPION'}), confidence=0.575609756097561,
lift=13.692163985469644), OrderedStatistic(items_base=frozenset({'SERTRALINE',
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confidence=0.5388127853881278, lift=13.4262859003847),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'BUPROPION',
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confidence=0.7037773359840954, lift=7.0715074442500185),
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'FLUOXETINE'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.8676470588235294, lift=4.188382606928782),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'VENLAFAXINE',
'BUPROPION'}), items_add=frozenset({'FLUOXETINE'}),
confidence=0.8740740740740742, lift=5.91057347670251),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'VENLAFAXINE',
'FLUOXETINE'}), items_add=frozenset({'BUPROPION'}),
confidence=0.6742857142857144, lift=4.301168287779167)]),
RelationRecord(items=frozenset({'SERTRALINE', 'BUPROPION', 'nan',
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'FLUOXETINE'}), items_add=frozenset({'SERTRALINE', 'nan'}),
confidence=0.711738484398217, lift=3.4596679372052463),
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items_add=frozenset({'nan', 'FLUOXETINE'}), confidence=0.6794326241134753,
lift=4.639285466768315), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'FLUOXETINE'}), items_add=frozenset({'BUPROPION', 'nan'}),
confidence=0.492798353909465, lift=3.1724485201772468),
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items_add=frozenset({'SERTRALINE'}), confidence=0.7380585516178737,
lift=3.562821505651048), OrderedStatistic(items_base=frozenset({'SERTRALINE',
'BUPROPION', 'nan'}), items_add=frozenset({'FLUOXETINE'}),
confidence=0.7033773861967695, lift=4.756305954241864),

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OrderedStatistic(items_base=frozenset({'SERTRALINE', 'nan', 'FLUOXETINE'}),
items_add=frozenset({'BUPROPION'}), confidence=0.5052742616033755,
lift=3.223069367473795)),
RelationRecord(items=frozenset({'VENLAFAXINE', 'BUPROPION', 'nan',
'FLUOXETINE'}), support=0.02289803220035778,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'BUPROPION', 'nan', 'FLUOXETINE'}),
confidence=0.23007789095266626, lift=5.945155980394781),
OrderedStatistic(items_base=frozenset({'BUPROPION', 'FLUOXETINE'}),
items_add=frozenset({'VENLAFAXINE', 'nan'}), confidence=0.5705794947994056,
lift=5.816789135432239), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'BUPROPION'}), items_add=frozenset({'nan', 'FLUOXETINE'}),
confidence=0.6772486772486772, lift=4.624373093428468),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'FLUOXETINE'}),
items_add=frozenset({'BUPROPION', 'nan'}), confidence=0.624390243902439,
lift=4.019587097982304), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'nan'}), items_add=frozenset({'BUPROPION', 'FLUOXETINE'}),
confidence=0.23343465045592707, lift=5.816789135432239),
OrderedStatistic(items_base=frozenset({'BUPROPION', 'nan', 'FLUOXETINE'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.5916795069337442,
lift=5.945155980394781), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'BUPROPION', 'nan'}), items_add=frozenset({'FLUOXETINE'}),
confidence=0.7071823204419889, lift=4.782035287827481),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'nan', 'FLUOXETINE'}),
items_add=frozenset({'BUPROPION'}), confidence=0.649746192893401,
lift=4.144634330476354))),
RelationRecord(items=frozenset({'Male', 'Old men', 'BUPROPION', 'nan'}),
support=0.03005366726296959,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'Male',
'BUPROPION'}), items_add=frozenset({'Old men', 'nan'}),
confidence=0.6206896551724138, lift=3.4501045797949548),
OrderedStatistic(items_base=frozenset({'Old men', 'BUPROPION'}),
items_add=frozenset({'Male', 'nan'}), confidence=0.984375,
lift=3.868752929458636), OrderedStatistic(items_base=frozenset({'Male',
'BUPROPION', 'nan'}), items_add=frozenset({'Old men'}),
confidence=0.6276463262764633, lift=3.4795467410434013),
OrderedStatistic(items_base=frozenset({'Old men', 'BUPROPION', 'nan'}),
items_add=frozenset({'Male'}), confidence=1.0, lift=3.9218896164639854)]),
RelationRecord(items=frozenset({'SERTRALINE', 'VENLAFAXINE', 'BUPROPION',
'nan'}), support=0.022719141323792488,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'SERTRALINE', 'BUPROPION', 'nan'}),
confidence=0.22828040742959857, lift=5.621530738024036),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'BUPROPION'}),
items_add=frozenset({'VENLAFAXINE', 'nan'}), confidence=0.5404255319148936,
lift=5.509383690098947), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'BUPROPION'}), items_add=frozenset({'SERTRALINE', 'nan'}),

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confidence=0.671957671957672, lift=3.2662985967333795),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'VENLAFAXINE'}),
items_add=frozenset({'BUPROPION', 'nan'}), confidence=0.5799086757990868,
lift=3.7332316672363475), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'nan'}), items_add=frozenset({'SERTRALINE', 'BUPROPION'}),
confidence=0.23161094224924014, lift=5.509383690098947),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'BUPROPION', 'nan'}),
items_add=frozenset({'VENLAFAXINE'}), confidence=0.5594713656387665,
lift=5.621530738024036), OrderedStatistic(items_base=frozenset({'VENLAFAXINE',
'BUPROPION', 'nan'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.7016574585635359, lift=3.387102930371473),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'VENLAFAXINE', 'nan'}),
items_add=frozenset({'BUPROPION'}), confidence=0.6018957345971564,
lift=3.839403373599967)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'DULOXETINE', 'CITALOPRAM',
'FLUOXETINE'}), support=0.022659511031604056,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'CITALOPRAM', 'FLUOXETINE'}),
confidence=0.28592927012791575, lift=7.659798498474676),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'CITALOPRAM'}),
items_add=frozenset({'ESCITALOPRAM', 'FLUOXETINE'}),
confidence=0.7495069033530573, lift=14.666546988600665),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
items_add=frozenset({'DULOXETINE', 'FLUOXETINE'}),
confidence=0.42128603104212864, lift=14.017791151937494),
OrderedStatistic(items_base=frozenset({'CITALOPRAM', 'FLUOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'DULOXETINE'}),
confidence=0.4791929382093317, lift=14.479397430217102),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'DULOXETINE'}),
items_add=frozenset({'CITALOPRAM', 'FLUOXETINE'}),
confidence=0.6846846846846847, lift=14.479397430217103),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'FLUOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
confidence=0.753968253968254, lift=14.017791151937494),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'FLUOXETINE'}),
items_add=frozenset({'DULOXETINE', 'CITALOPRAM'}),
confidence=0.44340723453908987, lift=14.666546988600665),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'DULOXETINE',
'CITALOPRAM'}), items_add=frozenset({'FLUOXETINE'}),
confidence=0.8899297423887588, lift=6.017791040265921),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'CITALOPRAM',
'FLUOXETINE'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.9047619047619048, lift=4.869337979094077),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'CITALOPRAM',
'FLUOXETINE'}), items_add=frozenset({'DULOXETINE'}),
confidence=0.6070287539936103, lift=7.659798498474677),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'DULOXETINE',

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'FLUOXETINE'})), items_add=frozenset({'CITALOPRAM'}),
confidence=0.871559633027523, lift=5.884080131188229)]),
  RelationRecord(items=frozenset({'ESCITALOPRAM', 'DULOXETINE', 'SERTRALINE',
'CITALOPRAM'}), support=0.024150268336314847,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'SERTRALINE', 'CITALOPRAM'}),
confidence=0.3047404063205418, lift=7.029568932593516),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'CITALOPRAM'}),
items_add=frozenset({'ESCITALOPRAM', 'SERTRALINE'}),
confidence=0.7988165680473372, lift=12.91818114383206),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
items_add=frozenset({'SERTRALINE', 'DULOXETINE'}),
confidence=0.4490022172949002, lift=13.84148379418286),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'CITALOPRAM'}),
items_add=frozenset({'ESCITALOPRAM', 'DULOXETINE'}),
confidence=0.40218470705064546, lift=12.15250006709788),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'DULOXETINE'}),
items_add=frozenset({'SERTRALINE', 'CITALOPRAM'}),
confidence=0.7297297297297296, lift=12.152500067097879),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'DULOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
confidence=0.744485294117647, lift=13.84148379418286),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'SERTRALINE'}),
items_add=frozenset({'DULOXETINE', 'CITALOPRAM'}), confidence=0.390549662487946,
lift=12.91818114383206), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'DULOXETINE', 'CITALOPRAM'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.9484777517564402, lift=4.578575675577289),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'SERTRALINE',
'CITALOPRAM'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.8940397350993377, lift=4.811632335563509),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'SERTRALINE',
'CITALOPRAM'}), items_add=frozenset({'DULOXETINE'}),
confidence=0.5570839064649243, lift=7.029568932593515),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'SERTRALINE',
'DULOXETINE'}), items_add=frozenset({'CITALOPRAM'}),
confidence=0.8842794759825326, lift=5.969954433263717)]),
  RelationRecord(items=frozenset({'ESCITALOPRAM', 'DULOXETINE', 'CITALOPRAM',
'VENLAFAXINE'}), support=0.021526535480023853,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'VENLAFAXINE', 'CITALOPRAM'}),
confidence=0.27163280662151995, lift=8.777036930718477),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'ESCITALOPRAM', 'DULOXETINE', 'CITALOPRAM'}),
confidence=0.21629718394248054, lift=8.494856615258545),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'CITALOPRAM'}),
items_add=frozenset({'ESCITALOPRAM', 'VENLAFAXINE'}),
confidence=0.7120315581854044, lift=18.11952842301856),

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OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
items_add=frozenset({'VENLAFAXINE', 'DULOXETINE'}),
confidence=0.4002217294900222, lift=13.669487583600148),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'CITALOPRAM'}),
items_add=frozenset({'ESCITALOPRAM', 'DULOXETINE'}),
confidence=0.572107765451664, lift=17.28693193986379),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'DULOXETINE'}),
items_add=frozenset({'VENLAFAXINE', 'CITALOPRAM'}),
confidence=0.6504504504504505, lift=17.286931939863795),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'DULOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
confidence=0.7352342158859471, lift=13.669487583600148),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'VENLAFAXINE'}),
items_add=frozenset({'DULOXETINE', 'CITALOPRAM'}),
confidence=0.5477996965098635, lift=18.11952842301856),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'DULOXETINE',
'CITALOPRAM'}), items_add=frozenset({'VENLAFAXINE'}),
confidence=0.8454332552693209, lift=8.494856615258545),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'CITALOPRAM',
'VENLAFAXINE'}), items_add=frozenset({'ESCITALOPRAM'}),
confidence=0.8913580246913582, lift=4.797199638663054),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'VENLAFAXINE',
'CITALOPRAM'}), items_add=frozenset({'DULOXETINE'}),
confidence=0.6955684007707129, lift=8.777036930718477),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'VENLAFAXINE',
'DULOXETINE'}), items_add=frozenset({'CITALOPRAM'}),
confidence=0.8891625615763546, lift=6.002921158468385)]),
RelationRecord(items=frozenset({'ESCITALOPRAM', 'DULOXETINE', 'CITALOPRAM',
'nan'}), support=0.024031007751937984,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'ESCITALOPRAM', 'CITALOPRAM', 'nan'}),
confidence=0.30323551542513166, lift=5.791867418769314),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'CITALOPRAM'}),
items_add=frozenset({'ESCITALOPRAM', 'nan'}), confidence=0.7948717948717948,
lift=4.311125485122897), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'CITALOPRAM'}), items_add=frozenset({'DULOXETINE', 'nan'}),
confidence=0.44678492239467854, lift=5.741443025715524),
OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'DULOXETINE'}),
items_add=frozenset({'CITALOPRAM', 'nan'}), confidence=0.726126126126126,
lift=4.950054932981762), OrderedStatistic(items_base=frozenset({'DULOXETINE',
'nan'}), items_add=frozenset({'ESCITALOPRAM', 'CITALOPRAM'}),
confidence=0.3088122605363985, lift=5.741443025715524),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'CITALOPRAM', 'nan'}),
items_add=frozenset({'ESCITALOPRAM'}), confidence=0.834368530020704,
lift=4.490487884610785), OrderedStatistic(items_base=frozenset({'ESCITALOPRAM',
'CITALOPRAM', 'nan'}), items_add=frozenset({'DULOXETINE'}),
confidence=0.45899772209567197, lift=5.791867418769314),

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OrderedStatistic(items_base=frozenset({'ESCITALOPRAM', 'DULOXETINE', 'nan'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.7589453860640301,
lift=5.12379795664001)),
RelationRecord(items=frozenset({'DULOXETINE', 'SERTRALINE', 'CITALOPRAM',
'FLUOXETINE'}), support=0.024090638044126415,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'SERTRALINE', 'CITALOPRAM', 'FLUOXETINE'}),
confidence=0.3039879608728367, lift=7.1599411570751),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'CITALOPRAM'}),
items_add=frozenset({'SERTRALINE', 'FLUOXETINE'}), confidence=0.796844181459566,
lift=13.748021525799302), OrderedStatistic(items_base=frozenset({'CITALOPRAM',
'FLUOXETINE'}), items_add=frozenset({'SERTRALINE', 'DULOXETINE'}),
confidence=0.5094577553593946, lift=15.705159112825456),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'CITALOPRAM'}),
items_add=frozenset({'DULOXETINE', 'FLUOXETINE'}),
confidence=0.40119165839126114, lift=13.349174823852081),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'FLUOXETINE'}),
items_add=frozenset({'SERTRALINE', 'CITALOPRAM'}),
confidence=0.8015873015873015, lift=13.349174823852081),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'DULOXETINE'}),
items_add=frozenset({'CITALOPRAM', 'FLUOXETINE'}),
confidence=0.7426470588235293, lift=15.705159112825456),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'FLUOXETINE'}),
items_add=frozenset({'DULOXETINE', 'CITALOPRAM'}),
confidence=0.4156378600823045, lift=13.748021525799304),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'CITALOPRAM',
'FLUOXETINE'}), items_add=frozenset({'SERTRALINE'}),
confidence=0.9619047619047618, lift=4.64339172629328),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'SERTRALINE',
'CITALOPRAM'}), items_add=frozenset({'FLUOXETINE'}),
confidence=0.8918322295805738, lift=6.030655842768638),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'CITALOPRAM',
'FLUOXETINE'}), items_add=frozenset({'DULOXETINE'}),
confidence=0.5674157303370786, lift=7.1599411570751),
OrderedStatistic(items_base=frozenset({'SERTRALINE', 'DULOXETINE',
'FLUOXETINE'}), items_add=frozenset({'CITALOPRAM'}),
confidence=0.9119638826185101, lift=6.1568576133302795)]),
RelationRecord(items=frozenset({'DULOXETINE', 'CITALOPRAM', 'VENLAFAXINE',
'FLUOXETINE'}), support=0.021526535480023853,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'VENLAFAXINE', 'CITALOPRAM', 'FLUOXETINE'}),
confidence=0.27163280662151995, lift=9.11056433408578),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE'}),
items_add=frozenset({'DULOXETINE', 'CITALOPRAM', 'FLUOXETINE'}),
confidence=0.21629718394248054, lift=8.636437558846186),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'CITALOPRAM'}),
items_add=frozenset({'VENLAFAXINE', 'FLUOXETINE'}),

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confidence=0.7120315581854044, lift=19.415884928080054),
OrderedStatistic(items_base=frozenset({'CITALOPRAM', 'FLUOXETINE'}),
items_add=frozenset({'VENLAFAXINE', 'DULOXETINE'}),
confidence=0.4552332912988651, lift=15.548395712997896),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'CITALOPRAM'}),
items_add=frozenset({'DULOXETINE', 'FLUOXETINE'}), confidence=0.572107765451664,
lift=19.03620481473096), OrderedStatistic(items_base=frozenset({'DULOXETINE',
'FLUOXETINE'}), items_add=frozenset({'VENLAFAXINE', 'CITALOPRAM'}),
confidence=0.7162698412698413, lift=19.03620481473096),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'DULOXETINE'}),
items_add=frozenset({'CITALOPRAM', 'FLUOXETINE'}),
confidence=0.7352342158859471, lift=15.548395712997896),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'FLUOXETINE'}),
items_add=frozenset({'DULOXETINE', 'CITALOPRAM'}),
confidence=0.5869918699186992, lift=19.41588492808005),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'CITALOPRAM',
'FLUOXETINE'}), items_add=frozenset({'VENLAFAXINE'}),
confidence=0.8595238095238096, lift=8.636437558846188),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'CITALOPRAM',
'VENLAFAXINE'}), items_add=frozenset({'FLUOXETINE'}),
confidence=0.8913580246913582, lift=6.027449223416966),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'CITALOPRAM',
'FLUOXETINE'}), items_add=frozenset({'DULOXETINE'}),
confidence=0.7220000000000001, lift=9.11056433408578),
OrderedStatistic(items_base=frozenset({'VENLAFAXINE', 'DULOXETINE',
'FLUOXETINE'}), items_add=frozenset({'CITALOPRAM'}),
confidence=0.9070351758793971, lift=6.123582890296896))],
RelationRecord(items=frozenset({'DULOXETINE', 'CITALOPRAM', 'nan',
'FLUOXETINE'}), support=0.023613595706618962,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),
items_add=frozenset({'CITALOPRAM', 'nan', 'FLUOXETINE'}),
confidence=0.2979683972911964, lift=6.497958416870434),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'CITALOPRAM'}),
items_add=frozenset({'nan', 'FLUOXETINE'}), confidence=0.7810650887573964,
lift=5.333249812077174), OrderedStatistic(items_base=frozenset({'CITALOPRAM',
'FLUOXETINE'}), items_add=frozenset({'DULOXETINE', 'nan'}),
confidence=0.49936948297604034, lift=6.417184850197852),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'FLUOXETINE'}),
items_add=frozenset({'CITALOPRAM', 'nan'}), confidence=0.7857142857142857,
lift=5.356271777003484), OrderedStatistic(items_base=frozenset({'DULOXETINE',
'nan'}), items_add=frozenset({'CITALOPRAM', 'FLUOXETINE'}),
confidence=0.30344827586206896, lift=6.4171848501978515),
OrderedStatistic(items_base=frozenset({'DULOXETINE', 'CITALOPRAM', 'nan'}),
items_add=frozenset({'FLUOXETINE'}), confidence=0.8198757763975155,
lift=5.544079342817071), OrderedStatistic(items_base=frozenset({'CITALOPRAM',

```

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[13]: def inspect(results):
        lhs = [tuple(result[2][0][0])[0] for result in results]
        OrderedStatistic(items_base=frozenset({'DULOXETINE', 'nan', 'FLUOXETINE'}),
items_add=frozenset({'CITALOPRAM'}), confidence=0.825,
lift=5.569746376811594)],
        40
        RelationRecord(items=frozenset({'DULOXETINE', 'SERTRALINE', 'CITALOPRAM',
'VENLAFAXINE'}), support=0.022719141323792488,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'DULOXETINE'}),

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    rhs          = [tuple(result[2][0][1])[0] for result in results]
    supports     = [result[1] for result in results]
    confidences  = [result[2][0][2] for result in results]
    lifts       = [result[2][0][3] for result in results]
    return list(zip(lhs, rhs, supports, confidences, lifts))
resultsinDataFrame = pd.DataFrame(inspect(results), columns = ['Left Hand Side', 'Right Hand Side', 'Support', 'Confidence', 'Lift'])

```

```
[14]: resultsinDataFrame
```

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[14]:
```

	Left Hand Side	Right Hand Side	Support	Confidence	Lift
0	DULOXETINE	PAROXETINE	0.020692	0.261099	3.297156
1	DULOXETINE	TRAZODONE	0.023077	0.291196	3.240454
2	DULOXETINE	VENLAFAXINE	0.029278	0.369451	3.712216
3	Male	Old men	0.180382	0.707437	3.921890
4	Male	Young men	0.074597	0.292563	3.921890
..
205	Young women	Female	0.021467	0.345489	3.041395
206	CITALOPRAM	ESCITALOPRAM	0.020632	0.585448	14.146930
207	DULOXETINE	SERTRALINE	0.020572	0.259594	7.732480
208	ESCITALOPRAM	SERTRALINE	0.023614	0.439024	10.732418
209	VENLAFAXINE	SERTRALINE	0.024031	0.241462	7.192392

[210 rows x 5 columns]

```
[17]: resultsinDataFrame.nlargest(n=10, columns = 'Lift')
```

```
[17]:
```

	Left Hand Side	Right Hand Side	Support	Confidence	Lift
164	CITALOPRAM	ESCITALOPRAM	0.022063	0.626058	14.622541
206	CITALOPRAM	ESCITALOPRAM	0.020632	0.585448	14.146930
71	CITALOPRAM	ESCITALOPRAM	0.023256	0.659898	12.913066
165	CITALOPRAM	ESCITALOPRAM	0.021825	0.619289	12.467566
75	CITALOPRAM	SERTRALINE	0.024925	0.707276	12.202691
167	CITALOPRAM	SERTRALINE	0.023494	0.666667	11.793249
72	CITALOPRAM	ESCITALOPRAM	0.024270	0.688663	11.136821
178	ESCITALOPRAM	SERTRALINE	0.024508	0.455654	10.900598
208	ESCITALOPRAM	SERTRALINE	0.023614	0.439024	10.732418
166	CITALOPRAM	ESCITALOPRAM	0.022838	0.648054	10.728399

- 'CITALOPRAM' and 'ESCITALOPRAM' will go together to treat the patient

```
[26]: # INSERT CODE TO RE-FORMAT THE APRIORI OUTPUT INTO A PANDAS DATA-FRAME WITH
      ↪COLUMNS "rhs", "lhs", "supp", "conf", "supp x conf", "lift"
def reformat_results(results):
    keep=[]
    for i in range(0,len(results)):
        for j in range(0,len(list(results[i]))):
```

```

        if (j>1):
            for k in range(0,len(list(results[i][j]))):
                if(len(results[i][j][k][0])!=0):
                    rhs = list(results[i][j][k][0])
                    lhs = list(results[i][j][k][1])
                    conf = float(results[i][j][k][2])
                    lift = float(results[i][j][k][3])
                    keep.append([rhs,lhs,supp,conf,supp*conf,lift])

        if(j==1):
            supp = results[i][j]
    return pd.DataFrame(keep,columns=["rhs","lhs","supp","conf","supp *  

    ↪conf","lift"])

```

```

[21]: def convert_to_network(df):
    print(df)

    #BUILD GRAPH
    G = nx.DiGraph() # DIRECTED
    for row in df.iterrows():
        # for column in df.columns:
        lhs="_".join(row[1][0])
        rhs="_".join(row[1][1])
        conf=row[1][3]; #print(conf)
        if(lhs not in G.nodes):
            G.add_node(lhs)
        if(rhs not in G.nodes):
            G.add_node(rhs)

        edge=(lhs,rhs)
        if edge not in G.edges:
            G.add_edge(lhs, rhs, weight=conf)

    # print(G.nodes)
    # print(G.edges)
    return G

```

```

[36]: def plot_network(G):
    #SPECIFY X-Y POSITIONS FOR PLOTTING
    pos=nx.random_layout(G)

    #GENERATE PLOT
    fig, ax = plt.subplots()
    fig.set_size_inches(15, 15)

    #assign colors based on attributes
    weights_e      = [G[u][v]['weight'] for u,v in G.edges()]

```

```

#SAMPLE CMAP FOR COLORS
cmap=plt.cm.get_cmap('Blues')
colors_e = [cmap(G[u][v]['weight']*10) for u,v in G.edges()]

#PLOT
nx.draw(
G,
edgecolors="black",
edge_color=colors_e,
node_size=1000,
linewidths=1,
font_size=5,
font_color="white",
font_weight="bold",
width=weights_e,
with_labels=True,
pos=pos,
ax=ax
)
ax.set(title='Dracula')
plt.show()

# raise

```

```

[37]: pd_results = reformat_results(results)
      G=convert_to_network(pd_results)
      plot_network(G)

```

	rhs	lhs \
0	[DULOXETINE]	[PAROXETINE]
1	[PAROXETINE]	[DULOXETINE]
2	[DULOXETINE]	[TRAZODONE]
3	[TRAZODONE]	[DULOXETINE]
4	[DULOXETINE]	[VENLAFAXINE]
...
2166	[CITALOPRAM, ESCITALOPRAM, FLUOXETINE, SERTRAL...	[VENLAFAXINE]
2167	[CITALOPRAM, ESCITALOPRAM, VENLAFAXINE, FLUOXE...	[SERTRALINE]
2168	[CITALOPRAM, ESCITALOPRAM, VENLAFAXINE, SERTRA...	[FLUOXETINE]
2169	[CITALOPRAM, VENLAFAXINE, FLUOXETINE, SERTRALI...	[ESCITALOPRAM]
2170	[ESCITALOPRAM, VENLAFAXINE, FLUOXETINE, SERTRA...	[CITALOPRAM]

	supp	conf	supp * conf	lift
0	0.020692	0.261099	0.005403	3.297156
1	0.020692	0.261295	0.005407	3.297156
2	0.023077	0.291196	0.006720	3.240454
3	0.023077	0.256802	0.005926	3.240454
4	0.029278	0.369451	0.010817	3.712216

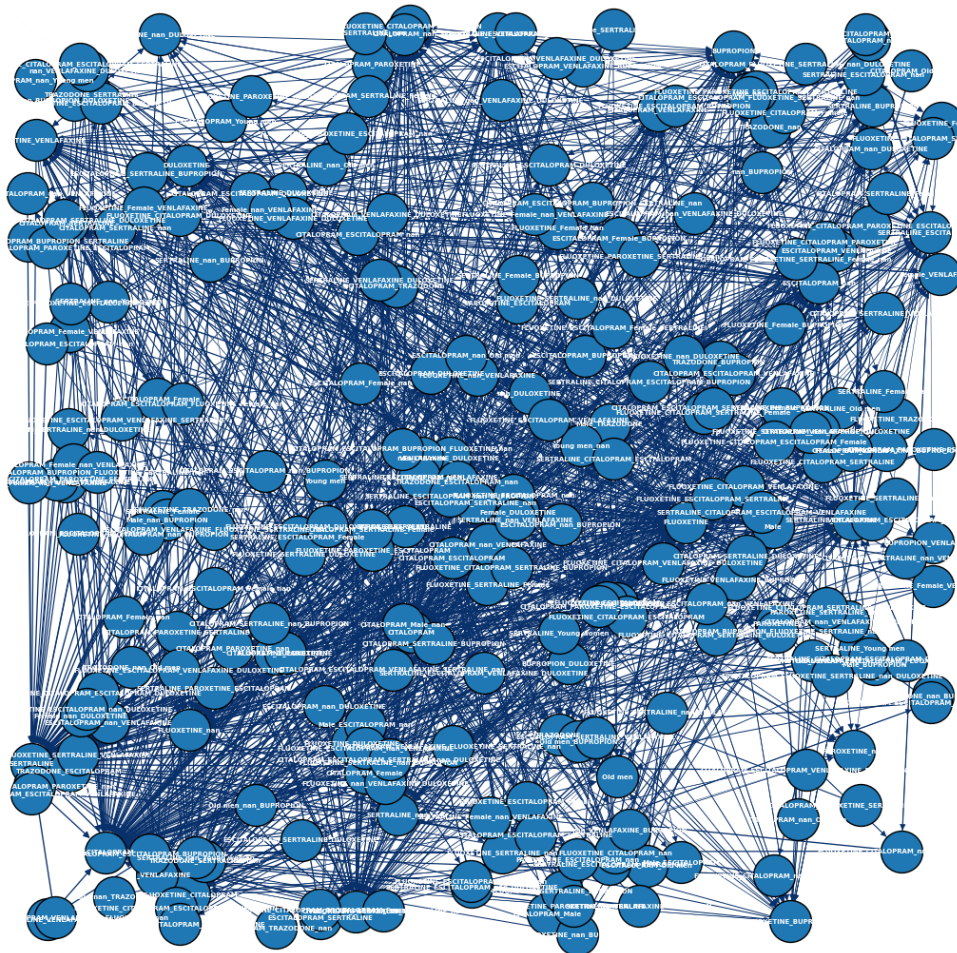
```

...
2166 0.024031 0.715808 0.017202 7.192392
2167 0.024031 0.959524 0.023058 4.631898
2168 0.024031 0.893570 0.021473 6.042406
2169 0.024031 0.889625 0.021379 4.787871
2170 0.024031 0.920091 0.022111 6.211728

```

[2171 rows x 6 columns]

Dracula



[]: