

# ml6

October 15, 2024

```
[1]: import pandas as pd
!pip install apyori
from apyori import apriori
```

```
Collecting apyori
  Downloading apyori-1.1.2.tar.gz (8.6 kB)
  Preparing metadata (setup.py) ... done
Building wheels for collected packages: apyori
  Building wheel for apyori (setup.py) ... done
  Created wheel for apyori: filename=apyori-1.1.2-py3-none-any.whl size=5953
sha256=2c2321ffaa6468b6f7ce3c31f95efc1580d3f3db3c6e2a087a11a1eb068a9426
  Stored in directory: /root/.cache/pip/wheels/c4/1a/79/20f55c470a50bb3702a8cb7c
94d8ada15573538c7f4baebe2d
Successfully built apyori
Installing collected packages: apyori
Successfully installed apyori-1.1.2
```

```
[3]: A=pd.read_csv("Market_Basket_Optimisation.csv",header=None)
```

```
[4]: A
```

```
[4]:
```

	0	1	2	3	\
0	shrimp	almonds	avocado	vegetables mix	
1	burgers	meatballs	eggs	NaN	
2	chutney	NaN	NaN	NaN	
3	turkey	avocado	NaN	NaN	
4	mineral water	milk	energy bar	whole wheat rice	
...	...	...	...	...	
7496	butter	light mayo	fresh bread	NaN	
7497	burgers	frozen vegetables	eggs	french fries	
7498	chicken	NaN	NaN	NaN	
7499	escalope	green tea	NaN	NaN	
7500	eggs	frozen smoothie	yogurt cake	low fat yogurt	

  

	4	5	6	7	8	\
0	green grapes	whole weat flour	yams	cottage cheese	energy drink	
1	NaN	NaN	NaN	NaN	NaN	
2	NaN	NaN	NaN	NaN	NaN	

3		NaN		NaN	NaN		NaN	NaN
4	green	tea		NaN	NaN		NaN	NaN
...	...		...	...		...	...	
7496		NaN		NaN	NaN		NaN	NaN
7497	magazines		green	tea	NaN		NaN	NaN
7498		NaN		NaN	NaN		NaN	NaN
7499		NaN		NaN	NaN		NaN	NaN
7500		NaN		NaN	NaN		NaN	NaN

  

	9		10		11	12	13		14 \		
0	tomato	juice	low	fat	yogurt	green	tea	honey	salad	mineral	water
1		NaN			NaN		NaN	NaN	NaN		NaN
2		NaN			NaN		NaN	NaN	NaN		NaN
3		NaN			NaN		NaN	NaN	NaN		NaN
4		NaN			NaN		NaN	NaN	NaN		NaN
...	...		...		...	...		...			
7496		NaN			NaN		NaN	NaN	NaN		NaN
7497		NaN			NaN		NaN	NaN	NaN		NaN
7498		NaN			NaN		NaN	NaN	NaN		NaN
7499		NaN			NaN		NaN	NaN	NaN		NaN
7500		NaN			NaN		NaN	NaN	NaN		NaN

  

	15		16		17		18		19
0	salmon	antioxydant	juice	frozen	smoothie	spinach	olive	oil	
1		NaN		NaN		NaN	NaN	NaN	
2		NaN		NaN		NaN	NaN	NaN	
3		NaN		NaN		NaN	NaN	NaN	
4		NaN		NaN		NaN	NaN	NaN	
...	...		...		...	...	...		
7496		NaN		NaN		NaN	NaN	NaN	
7497		NaN		NaN		NaN	NaN	NaN	
7498		NaN		NaN		NaN	NaN	NaN	
7499		NaN		NaN		NaN	NaN	NaN	
7500		NaN		NaN		NaN	NaN	NaN	

[7501 rows x 20 columns]

```
[5]: A.isnull().sum()
```

```
[5]: 0      0
      1    1754
      2    3112
      3    4156
      4    4972
      5    5637
      6    6132
      7    6520
```

```

8      6847
9      7106
10     7245
11     7347
12     7414
13     7454
14     7476
15     7493
16     7497
17     7497
18     7498
19     7500
dtype: int64

```

```

[7]: A.fillna(0,inplace=True)
A.head()

```

```

[7]:
      0      1      2      3      4  \
0  shrimp  almonds  avocado  vegetables mix  green grapes
1  burgers  meatballs      eggs      0      0
2  chutney      0      0      0      0
3  turkey  avocado      0      0      0
4  mineral water      milk  energy bar  whole wheat rice  green tea

      5      6      7      8      9  \
0  whole weat flour  yams  cottage cheese  energy drink  tomato juice
1      0      0      0      0      0
2      0      0      0      0      0
3      0      0      0      0      0
4      0      0      0      0      0

      10      11      12      13      14      15  \
0  low fat yogurt  green tea  honey  salad  mineral water  salmon
1      0      0      0      0      0      0
2      0      0      0      0      0      0
3      0      0      0      0      0      0
4      0      0      0      0      0      0

      16      17      18      19
0  antioxydant juice  frozen smoothie  spinach  olive oil
1      0      0      0      0
2      0      0      0      0
3      0      0      0      0
4      0      0      0      0

```

```

[10]: transactions=[]
for i in range(0,7501):

```

```
transactions.append([str(A.values[i,j]) for j in range(0,20)])
transactions[0]
```

```
[10]: ['shrimp',
      'almonds',
      'avocado',
      'vegetables mix',
      'green grapes',
      'whole weat flour',
      'yams',
      'cottage cheese',
      'energy drink',
      'tomato juice',
      'low fat yogurt',
      'green tea',
      'honey',
      'salad',
      'mineral water',
      'salmon',
      'antioxydant juice',
      'frozen smoothie',
      'spinach',
      'olive oil']
```

```
[11]: rule_list=apriori(transactions,min_support=0.003,min_lift=3,min_length=2)
      rule_list
```

```
[11]: <generator object apriori at 0x7b410b100cf0>
```

```
[13]: Results=list(rule_list)
```

```
[14]: for i in Results:
      print(i)
```

```
RelationRecord(items=frozenset({'brownies', 'cottage cheese'}),
support=0.0034662045060658577,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'brownies'}),
items_add=frozenset({'cottage cheese'}), confidence=0.10276679841897232,
lift=3.225329518580382), OrderedStatistic(items_base=frozenset({'cottage
cheese'}), items_add=frozenset({'brownies'}), confidence=0.10878661087866107,
lift=3.2253295185803816)])
RelationRecord(items=frozenset({'light cream', 'chicken'}),
support=0.004532728969470737,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'chicken'}),
items_add=frozenset({'light cream'}), confidence=0.07555555555555556,
lift=4.843950617283951), OrderedStatistic(items_base=frozenset({'light cream'}),
items_add=frozenset({'chicken'}), confidence=0.29059829059829057,
```

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lift=4.84395061728395]))
RelationRecord(items=frozenset({'mushroom cream sauce', 'escalope'}),
support=0.005732568990801226,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'escalope'}),
items_add=frozenset({'mushroom cream sauce'}), confidence=0.0722689075630252,
lift=3.7908326967150496), OrderedStatistic(items_base=frozenset({'mushroom cream
sauce'}), items_add=frozenset({'escalope'}), confidence=0.3006993006993007,
lift=3.790832696715049)]]
RelationRecord(items=frozenset({'pasta', 'escalope'}),
support=0.005865884548726837,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'escalope'}),
items_add=frozenset({'pasta'}), confidence=0.07394957983193277,
lift=4.700811850163794), OrderedStatistic(items_base=frozenset({'pasta'}),
items_add=frozenset({'escalope'}), confidence=0.3728813559322034,
lift=4.700811850163794)]]
RelationRecord(items=frozenset({'tomato juice', 'fresh bread'}),
support=0.004266097853619517,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'fresh bread'}),
items_add=frozenset({'tomato juice'}), confidence=0.09907120743034055,
lift=3.2593558198902826), OrderedStatistic(items_base=frozenset({'tomato
juice'}), items_add=frozenset({'fresh bread'}), confidence=0.14035087719298245,
lift=3.2593558198902826)]]
RelationRecord(items=frozenset({'honey', 'fresh tuna'}),
support=0.003999466737768298,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'fresh tuna'}),
items_add=frozenset({'honey'}), confidence=0.17964071856287428,
lift=3.7850703088205613), OrderedStatistic(items_base=frozenset({'honey'}),
items_add=frozenset({'fresh tuna'}), confidence=0.08426966292134831,
lift=3.7850703088205613)]]
RelationRecord(items=frozenset({'honey', 'fromage blanc'}),
support=0.003332888948140248,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'fromage blanc'}),
items_add=frozenset({'honey'}), confidence=0.2450980392156863,
lift=5.164270764485569), OrderedStatistic(items_base=frozenset({'honey'}),
items_add=frozenset({'fromage blanc'}), confidence=0.0702247191011236,
lift=5.16427076448557)]]
RelationRecord(items=frozenset({'herb & pepper', 'ground beef'}),
support=0.015997866951073192,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'herb & pepper'}), confidence=0.1628222523744912,
lift=3.291993841134928), OrderedStatistic(items_base=frozenset({'herb &
pepper'}), items_add=frozenset({'ground beef'}), confidence=0.3234501347708895,
lift=3.2919938411349285)]]
RelationRecord(items=frozenset({'tomato sauce', 'ground beef'}),
support=0.005332622317024397,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'tomato sauce'}), confidence=0.054274084124830396,
lift=3.840659481324083), OrderedStatistic(items_base=frozenset({'tomato

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sauce'}), items_add=frozenset({'ground beef'}), confidence=0.3773584905660377,
lift=3.840659481324083)])
RelationRecord(items=frozenset({'olive oil', 'light cream'}),
support=0.003199573390214638,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'light cream'}),
items_add=frozenset({'olive oil'}), confidence=0.20512820512820515,
lift=3.1147098515519573), OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'light cream'}), confidence=0.048582995951417005,
lift=3.114709851551957)])
RelationRecord(items=frozenset({'olive oil', 'whole wheat pasta'}),
support=0.007998933475536596,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'whole wheat pasta'}), confidence=0.12145748987854252,
lift=4.1224100976422955), OrderedStatistic(items_base=frozenset({'whole wheat
pasta'}), items_add=frozenset({'olive oil'}), confidence=0.2714932126696833,
lift=4.122410097642296)])
RelationRecord(items=frozenset({'pasta', 'shrimp'}),
support=0.005065991201173177,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'pasta'}),
items_add=frozenset({'shrimp'}), confidence=0.3220338983050847,
lift=4.506672147735896), OrderedStatistic(items_base=frozenset({'shrimp'}),
items_add=frozenset({'pasta'}), confidence=0.0708955223880597,
lift=4.506672147735896)])
RelationRecord(items=frozenset({'brownies', '0', 'cottage cheese'}),
support=0.0034662045060658577,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'brownies'}),
items_add=frozenset({'0', 'cottage cheese'}), confidence=0.10276679841897232,
lift=3.2388813232802995), OrderedStatistic(items_base=frozenset({'cottage
cheese'}), items_add=frozenset({'brownies', '0'}),
confidence=0.10878661087866107, lift=3.2253295185803816),
OrderedStatistic(items_base=frozenset({'brownies', '0'}),
items_add=frozenset({'cottage cheese'}), confidence=0.10276679841897232,
lift=3.225329518580382), OrderedStatistic(items_base=frozenset({'0', 'cottage
cheese'}), items_add=frozenset({'brownies'}), confidence=0.10924369747899158,
lift=3.2388813232802995)])
RelationRecord(items=frozenset({'light cream', 'chicken', '0'}),
support=0.004532728969470737,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'chicken'}),
items_add=frozenset({'light cream', '0'}), confidence=0.07555555555555556,
lift=4.843950617283951), OrderedStatistic(items_base=frozenset({'light cream'}),
items_add=frozenset({'chicken', '0'}), confidence=0.29059829059829057,
lift=4.84395061728395), OrderedStatistic(items_base=frozenset({'chicken', '0'}),
items_add=frozenset({'light cream'}), confidence=0.07555555555555556,
lift=4.843950617283951), OrderedStatistic(items_base=frozenset({'light cream',
'0'}), items_add=frozenset({'chicken'}), confidence=0.29059829059829057,
lift=4.84395061728395)])
RelationRecord(items=frozenset({'escalope', 'mushroom cream sauce', '0'}),
support=0.005732568990801226,

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ordered_statistics=[OrderedStatistic(items_base=frozenset({'escalope'}),
items_add=frozenset({'mushroom cream sauce', '0'}),
confidence=0.0722689075630252, lift=3.7908326967150496),
OrderedStatistic(items_base=frozenset({'mushroom cream sauce'}),
items_add=frozenset({'0', 'escalope'}), confidence=0.3006993006993007,
lift=3.790832696715049), OrderedStatistic(items_base=frozenset({'escalope',
'0'}), items_add=frozenset({'mushroom cream sauce'}),
confidence=0.0722689075630252, lift=3.7908326967150496),
OrderedStatistic(items_base=frozenset({'mushroom cream sauce', '0'}),
items_add=frozenset({'escalope'}), confidence=0.3006993006993007,
lift=3.790832696715049)])
RelationRecord(items=frozenset({'escalope', 'pasta', '0'}),
support=0.005865884548726837,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'escalope'}),
items_add=frozenset({'pasta', '0'}), confidence=0.07394957983193277,
lift=4.700811850163794), OrderedStatistic(items_base=frozenset({'pasta'}),
items_add=frozenset({'0', 'escalope'}), confidence=0.3728813559322034,
lift=4.700811850163794), OrderedStatistic(items_base=frozenset({'escalope',
'0'}), items_add=frozenset({'pasta'}), confidence=0.07394957983193277,
lift=4.700811850163794), OrderedStatistic(items_base=frozenset({'pasta', '0'}),
items_add=frozenset({'escalope'}), confidence=0.3728813559322034,
lift=4.700811850163794)])
RelationRecord(items=frozenset({'tomato juice', '0', 'fresh bread'}),
support=0.004266097853619517,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'fresh bread'}),
items_add=frozenset({'0', 'tomato juice'}), confidence=0.09907120743034055,
lift=3.273714215572619), OrderedStatistic(items_base=frozenset({'tomato
juice'}), items_add=frozenset({'0', 'fresh bread'}),
confidence=0.14035087719298245, lift=3.2593558198902826),
OrderedStatistic(items_base=frozenset({'0', 'fresh bread'}),
items_add=frozenset({'tomato juice'}), confidence=0.09907120743034055,
lift=3.2593558198902826), OrderedStatistic(items_base=frozenset({'0', 'tomato
juice'}), items_add=frozenset({'fresh bread'}), confidence=0.1409691629955947,
lift=3.2737142155726184)])
RelationRecord(items=frozenset({'honey', 'fresh tuna', '0'}),
support=0.003999466737768298,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'fresh tuna'}),
items_add=frozenset({'honey', '0'}), confidence=0.17964071856287428,
lift=3.795732478704563), OrderedStatistic(items_base=frozenset({'honey'}),
items_add=frozenset({'fresh tuna', '0'}), confidence=0.08426966292134831,
lift=3.7850703088205613), OrderedStatistic(items_base=frozenset({'fresh tuna',
'0'}), items_add=frozenset({'honey'}), confidence=0.17964071856287428,
lift=3.7850703088205613), OrderedStatistic(items_base=frozenset({'honey', '0'}),
items_add=frozenset({'fresh tuna'}), confidence=0.08450704225352113,
lift=3.7957324787045628)])
RelationRecord(items=frozenset({'honey', '0', 'fromage blanc'}),
support=0.003332888948140248,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'fromage blanc'}),

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items_add=frozenset({'honey', '0'}), confidence=0.2450980392156863,
lift=5.1788180060756694), OrderedStatistic(items_base=frozenset({'honey'}),
items_add=frozenset({'0', 'fromage blanc'}), confidence=0.0702247191011236,
lift=5.16427076448557), OrderedStatistic(items_base=frozenset({'0', 'fromage
blanc'}), items_add=frozenset({'honey'}), confidence=0.2450980392156863,
lift=5.164270764485569), OrderedStatistic(items_base=frozenset({'honey', '0'}),
items_add=frozenset({'fromage blanc'}), confidence=0.07042253521126761,
lift=5.17881800607567)])
RelationRecord(items=frozenset({'herb & pepper', 'ground beef', '0'}),
support=0.015997866951073192,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'herb & pepper', '0'}), confidence=0.1628222523744912,
lift=3.291993841134928), OrderedStatistic(items_base=frozenset({'herb &
pepper'}), items_add=frozenset({'ground beef', '0'}),
confidence=0.3234501347708895, lift=3.2919938411349285),
OrderedStatistic(items_base=frozenset({'ground beef', '0'}),
items_add=frozenset({'herb & pepper'}), confidence=0.1628222523744912,
lift=3.291993841134928), OrderedStatistic(items_base=frozenset({'herb & pepper',
'0'}), items_add=frozenset({'ground beef'}), confidence=0.3234501347708895,
lift=3.2919938411349285)])
RelationRecord(items=frozenset({'tomato sauce', 'ground beef', '0'}),
support=0.005332622317024397,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'tomato sauce', '0'}), confidence=0.054274084124830396,
lift=3.840659481324083), OrderedStatistic(items_base=frozenset({'tomato
sauce'}), items_add=frozenset({'ground beef', '0'}),
confidence=0.3773584905660377, lift=3.840659481324083),
OrderedStatistic(items_base=frozenset({'ground beef', '0'}),
items_add=frozenset({'tomato sauce'}), confidence=0.054274084124830396,
lift=3.840659481324083), OrderedStatistic(items_base=frozenset({'tomato sauce',
'0'}), items_add=frozenset({'ground beef'}), confidence=0.3773584905660377,
lift=3.840659481324083)])
RelationRecord(items=frozenset({'olive oil', 'light cream', '0'}),
support=0.003199573390214638,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'light cream'}),
items_add=frozenset({'olive oil', '0'}), confidence=0.20512820512820515,
lift=3.121027721433401), OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'light cream', '0'}), confidence=0.048582995951417005,
lift=3.114709851551957), OrderedStatistic(items_base=frozenset({'light cream',
'0'}), items_add=frozenset({'olive oil'}), confidence=0.20512820512820515,
lift=3.1147098515519573), OrderedStatistic(items_base=frozenset({'olive oil',
'0'}), items_add=frozenset({'light cream'}), confidence=0.0486815415821501,
lift=3.121027721433401)])
RelationRecord(items=frozenset({'olive oil', '0', 'whole wheat pasta'}),
support=0.007998933475536596,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'whole wheat pasta', '0'}), confidence=0.12145748987854252,
lift=4.1224100976422955), OrderedStatistic(items_base=frozenset({'whole wheat

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pasta'}), items_add=frozenset({'olive oil', '0'}),
confidence=0.2714932126696833, lift=4.13077198425009),
OrderedStatistic(items_base=frozenset({'olive oil', '0'}),
items_add=frozenset({'whole wheat pasta'}), confidence=0.12170385395537525,
lift=4.13077198425009), OrderedStatistic(items_base=frozenset({'whole wheat
pasta', '0'}), items_add=frozenset({'olive oil'}),
confidence=0.2714932126696833, lift=4.122410097642296)])
RelationRecord(items=frozenset({'pasta', 'shrimp', '0'}),
support=0.005065991201173177,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'pasta'}),
items_add=frozenset({'shrimp', '0'}), confidence=0.3220338983050847,
lift=4.515095833993347), OrderedStatistic(items_base=frozenset({'shrimp'}),
items_add=frozenset({'pasta', '0'}), confidence=0.0708955223880597,
lift=4.506672147735896), OrderedStatistic(items_base=frozenset({'pasta', '0'}),
items_add=frozenset({'shrimp'}), confidence=0.3220338983050847,
lift=4.506672147735896), OrderedStatistic(items_base=frozenset({'shrimp', '0'}),
items_add=frozenset({'pasta'}), confidence=0.07102803738317758,
lift=4.515095833993347)])
RelationRecord(items=frozenset({'milk', 'spaghetti', 'avocado'}),
support=0.003332888948140248,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk'}),
items_add=frozenset({'spaghetti', 'avocado'}), confidence=0.025720164609053502,
lift=3.2154492455418384), OrderedStatistic(items_base=frozenset({'spaghetti',
'avocado'}), items_add=frozenset({'milk'}), confidence=0.4166666666666663,
lift=3.215449245541838)])
RelationRecord(items=frozenset({'milk', 'cake', 'burgers'}),
support=0.0037328356219170776,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'burgers'}),
items_add=frozenset({'milk', 'cake'}), confidence=0.04281345565749235,
lift=3.211437308868501), OrderedStatistic(items_base=frozenset({'milk',
'cake'}), items_add=frozenset({'burgers'}), confidence=0.2799999999999997,
lift=3.211437308868501)])
RelationRecord(items=frozenset({'chocolate', 'burgers', 'turkey'}),
support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'burgers'}),
items_add=frozenset({'chocolate', 'turkey'}), confidence=0.035168195718654434,
lift=3.1034898363014927), OrderedStatistic(items_base=frozenset({'chocolate',
'turkey'}), items_add=frozenset({'burgers'}), confidence=0.27058823529411763,
lift=3.1034898363014927)])
RelationRecord(items=frozenset({'milk', 'burgers', 'turkey'}),
support=0.003199573390214638,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'burgers'}),
items_add=frozenset({'milk', 'turkey'}), confidence=0.03669724770642202,
lift=3.2384241770102538), OrderedStatistic(items_base=frozenset({'milk',
'turkey'}), items_add=frozenset({'burgers'}), confidence=0.2823529411764706,
lift=3.2384241770102533)])
RelationRecord(items=frozenset({'frozen vegetables', 'cake', 'tomatoes'}),
support=0.0030662578322890282,

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ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'cake', 'tomatoes'}),
confidence=0.03216783216783217, lift=3.83001443001443),
OrderedStatistic(items_base=frozenset({'tomatoes'}),
items_add=frozenset({'frozen vegetables', 'cake'}),
confidence=0.04483430799220273, lift=4.367560314928736),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'cake'}),
items_add=frozenset({'tomatoes'}), confidence=0.2987012987012987,
lift=4.367560314928736), OrderedStatistic(items_base=frozenset({'cake',
'tomatoes'}), items_add=frozenset({'frozen vegetables'}),
confidence=0.36507936507936506, lift=3.8300144300144296)]]
RelationRecord(items=frozenset({'ground beef', 'cereals', 'spaghetti'}),
support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'cereals'}),
items_add=frozenset({'ground beef', 'spaghetti'}),
confidence=0.11917098445595856, lift=3.040481477565119),
OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'cereals', 'spaghetti'}), confidence=0.03120759837177748,
lift=4.681763907734057), OrderedStatistic(items_base=frozenset({'spaghetti'}),
items_add=frozenset({'ground beef', 'cereals'}), confidence=0.01761102603369066,
lift=3.885303125844519), OrderedStatistic(items_base=frozenset({'ground beef',
'cereals'}), items_add=frozenset({'spaghetti'}), confidence=0.6764705882352942,
lift=3.8853031258445188), OrderedStatistic(items_base=frozenset({'cereals',
'spaghetti'}), items_add=frozenset({'ground beef'}),
confidence=0.45999999999999996, lift=4.681763907734057),
OrderedStatistic(items_base=frozenset({'ground beef', 'spaghetti'}),
items_add=frozenset({'cereals'}), confidence=0.0782312925170068,
lift=3.0404814775651197)]]
RelationRecord(items=frozenset({'milk', 'ground beef', 'chicken'}),
support=0.0038661511798426876,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk'}),
items_add=frozenset({'ground beef', 'chicken'}), confidence=0.02983539094650206,
lift=3.1520460209818584), OrderedStatistic(items_base=frozenset({'ground beef',
'chicken'}), items_add=frozenset({'milk'}), confidence=0.40845070422535207,
lift=3.152046020981858)]]
RelationRecord(items=frozenset({'milk', 'olive oil', 'chicken'}),
support=0.0035995200639914677,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'chicken'}),
items_add=frozenset({'milk', 'olive oil'}), confidence=0.06, lift=3.51609375),
OrderedStatistic(items_base=frozenset({'milk'}), items_add=frozenset({'olive
oil', 'chicken'}), confidence=0.027777777777777778, lift=3.8585390946502063),
OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'milk', 'chicken'}), confidence=0.054655870445344125,
lift=3.6934566145092456), OrderedStatistic(items_base=frozenset({'milk',
'chicken'}), items_add=frozenset({'olive oil'}), confidence=0.24324324324324323,
lift=3.693456614509246), OrderedStatistic(items_base=frozenset({'olive oil',
'chicken'}), items_add=frozenset({'milk'}), confidence=0.5,
lift=3.858539094650206), OrderedStatistic(items_base=frozenset({'milk', 'olive

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oil'}), items_add=frozenset({'chicken'}), confidence=0.2109375,
lift=3.51609375)])
RelationRecord(items=frozenset({'milk', 'chicken', 'pancakes'}),
support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'chicken'}),
items_add=frozenset({'milk', 'pancakes'}), confidence=0.051111111111111114,
lift=3.091810035842294), OrderedStatistic(items_base=frozenset({'milk',
'pancakes'}), items_add=frozenset({'chicken'}), confidence=0.18548387096774194,
lift=3.091810035842294)])
RelationRecord(items=frozenset({'olive oil', 'chicken', 'spaghetti'}),
support=0.0034662045060658577,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'chicken', 'spaghetti'}), confidence=0.05263157894736842,
lift=3.0603835169318647), OrderedStatistic(items_base=frozenset({'chicken',
'spaghetti'}), items_add=frozenset({'olive oil'}),
confidence=0.20155038759689922, lift=3.0603835169318647)])
RelationRecord(items=frozenset({'frozen vegetables', 'chocolate', 'shrimp'}),
support=0.005332622317024397,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'chocolate', 'shrimp'}),
confidence=0.055944055944055944, lift=3.1084175084175087),
OrderedStatistic(items_base=frozenset({'shrimp'}), items_add=frozenset({'frozen
vegetables', 'chocolate'}), confidence=0.07462686567164178,
lift=3.2545123221103784), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'chocolate'}), items_add=frozenset({'shrimp'}),
confidence=0.23255813953488375, lift=3.2545123221103784),
OrderedStatistic(items_base=frozenset({'chocolate', 'shrimp'}),
items_add=frozenset({'frozen vegetables'}), confidence=0.29629629629629634,
lift=3.1084175084175087)])
RelationRecord(items=frozenset({'chocolate', 'herb & pepper', 'ground beef'}),
support=0.003999466737768298,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'chocolate', 'herb & pepper'}),
confidence=0.0407055630936228, lift=4.490182775959774),
OrderedStatistic(items_base=frozenset({'herb & pepper'}),
items_add=frozenset({'chocolate', 'ground beef'}),
confidence=0.08086253369272238, lift=3.5060685851393676),
OrderedStatistic(items_base=frozenset({'chocolate', 'ground beef'}),
items_add=frozenset({'herb & pepper'}), confidence=0.17341040462427748,
lift=3.5060685851393676), OrderedStatistic(items_base=frozenset({'chocolate',
'herb & pepper'}), items_add=frozenset({'ground beef'}),
confidence=0.4411764705882354, lift=4.4901827759597746)])
RelationRecord(items=frozenset({'milk', 'chocolate', 'soup'}),
support=0.003999466737768298,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk'}),
items_add=frozenset({'chocolate', 'soup'}), confidence=0.030864197530864203,
lift=3.0462150747238472), OrderedStatistic(items_base=frozenset({'chocolate',
'soup'}), items_add=frozenset({'milk'}), confidence=0.3947368421052632,

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lift=3.0462150747238472)])
RelationRecord(items=frozenset({'cooking oil', 'ground beef', 'spaghetti'}),
support=0.004799360085321957,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'cooking oil', 'spaghetti'}),
confidence=0.048846675712347354, lift=3.078982474943844),
OrderedStatistic(items_base=frozenset({'spaghetti'}),
items_add=frozenset({'cooking oil', 'ground beef'}),
confidence=0.027565084226646247, lift=3.2819951870487856),
OrderedStatistic(items_base=frozenset({'cooking oil', 'ground beef'}),
items_add=frozenset({'spaghetti'}), confidence=0.5714285714285714,
lift=3.2819951870487856), OrderedStatistic(items_base=frozenset({'cooking oil',
'spaghetti'}), items_add=frozenset({'ground beef'}),
confidence=0.3025210084033613, lift=3.0789824749438446)])
RelationRecord(items=frozenset({'eggs', 'herb & pepper', 'ground beef'}),
support=0.0041327822956939075,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'eggs', 'herb & pepper'}), confidence=0.04206241519674356,
lift=3.3564912381997174), OrderedStatistic(items_base=frozenset({'herb &
pepper'}), items_add=frozenset({'eggs', 'ground beef'}),
confidence=0.08355795148247978, lift=4.178454627133872),
OrderedStatistic(items_base=frozenset({'eggs', 'ground beef'}),
items_add=frozenset({'herb & pepper'}), confidence=0.2066666666666667,
lift=4.178454627133872), OrderedStatistic(items_base=frozenset({'eggs', 'herb &
pepper'}), items_add=frozenset({'ground beef'}), confidence=0.3297872340425532,
lift=3.3564912381997174)])
RelationRecord(items=frozenset({'eggs', 'red wine', 'spaghetti'}),
support=0.0037328356219170776,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'red wine'}),
items_add=frozenset({'eggs', 'spaghetti'}), confidence=0.13270142180094788,
lift=3.6328224997405476), OrderedStatistic(items_base=frozenset({'spaghetti'}),
items_add=frozenset({'eggs', 'red wine'}), confidence=0.021439509954058193,
lift=3.0342974370828397), OrderedStatistic(items_base=frozenset({'eggs', 'red
wine'}), items_add=frozenset({'spaghetti'}), confidence=0.5283018867924528,
lift=3.0342974370828397), OrderedStatistic(items_base=frozenset({'eggs',
'spaghetti'}), items_add=frozenset({'red wine'}),
confidence=0.10218978102189781, lift=3.632822499740547)])
RelationRecord(items=frozenset({'herb & pepper', 'ground beef', 'french
fries'}), support=0.003199573390214638,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'herb & pepper', 'french fries'}),
confidence=0.03256445047489824, lift=4.697421981004071),
OrderedStatistic(items_base=frozenset({'herb & pepper'}),
items_add=frozenset({'ground beef', 'french fries'}),
confidence=0.0646900269541779, lift=4.665768194070082),
OrderedStatistic(items_base=frozenset({'ground beef', 'french fries'}),
items_add=frozenset({'herb & pepper'}), confidence=0.23076923076923078,
lift=4.665768194070081), OrderedStatistic(items_base=frozenset({'herb & pepper',

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'french fries'}), items_add=frozenset({'ground beef'}),
confidence=0.46153846153846156, lift=4.697421981004071)])
RelationRecord(items=frozenset({'frozen vegetables', 'green tea', 'tomatoes'}),
support=0.003332888948140248,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'tomatoes'}),
items_add=frozenset({'frozen vegetables', 'green tea'}),
confidence=0.04873294346978558, lift=3.38468341635983),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'green tea'}),
items_add=frozenset({'tomatoes'}), confidence=0.2314814814814815,
lift=3.38468341635983)])
RelationRecord(items=frozenset({'frozen vegetables', 'ground beef',
'spaghetti'}), support=0.008665511265164644,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'frozen vegetables', 'spaghetti'}),
confidence=0.08819538670284939, lift=3.165328208890303),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'spaghetti'}),
items_add=frozenset({'ground beef'}), confidence=0.31100478468899523,
lift=3.165328208890303)])
RelationRecord(items=frozenset({'frozen vegetables', 'milk', 'olive oil'}),
support=0.004799360085321957,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk'}),
items_add=frozenset({'frozen vegetables', 'olive oil'}),
confidence=0.037037037037037035, lift=3.2684095860566447),
OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'frozen vegetables', 'milk'}),
confidence=0.0728744939271255, lift=3.0883140053523634),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk'}),
items_add=frozenset({'olive oil'}), confidence=0.20338983050847456,
lift=3.088314005352364), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'olive oil'}), items_add=frozenset({'milk'}),
confidence=0.4235294117647058, lift=3.2684095860566447)])
RelationRecord(items=frozenset({'frozen vegetables', 'milk', 'soup'}),
support=0.003999466737768298,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk'}),
items_add=frozenset({'frozen vegetables', 'soup'}),
confidence=0.030864197530864203, lift=3.858539094650206),
OrderedStatistic(items_base=frozenset({'soup'}), items_add=frozenset({'frozen
vegetables', 'milk'}), confidence=0.079155672823219, lift=3.3545011403783374),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk'}),
items_add=frozenset({'soup'}), confidence=0.16949152542372883,
lift=3.354501140378338), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'soup'}), items_add=frozenset({'milk'}), confidence=0.5,
lift=3.858539094650206)])
RelationRecord(items=frozenset({'frozen vegetables', 'milk', 'tomatoes'}),
support=0.0041327822956939075,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'milk', 'tomatoes'}),
confidence=0.043356643356643354, lift=3.0973160173160172),

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OrderedStatistic(items_base=frozenset({'milk', 'tomatoes'}),
items_add=frozenset({'frozen vegetables'}), confidence=0.29523809523809524,
lift=3.0973160173160172)])
RelationRecord(items=frozenset({'frozen vegetables', 'shrimp', 'mineral
water'}), support=0.007199040127982935,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'shrimp', 'mineral water'}),
confidence=0.07552447552447553, lift=3.2006163328197226),
OrderedStatistic(items_base=frozenset({'shrimp', 'mineral water'}),
items_add=frozenset({'frozen vegetables'}), confidence=0.30508474576271183,
lift=3.200616332819722)])
RelationRecord(items=frozenset({'frozen vegetables', 'olive oil', 'spaghetti'}),
support=0.005732568990801226,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'frozen vegetables', 'spaghetti'}),
confidence=0.08704453441295547, lift=3.124024175270713),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'spaghetti'}),
items_add=frozenset({'olive oil'}), confidence=0.20574162679425836,
lift=3.1240241752707125)])
RelationRecord(items=frozenset({'frozen vegetables', 'shrimp', 'spaghetti'}),
support=0.005999200106652446,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'shrimp'}),
items_add=frozenset({'frozen vegetables', 'spaghetti'}),
confidence=0.08395522388059701, lift=3.013148968078269),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'spaghetti'}),
items_add=frozenset({'shrimp'}), confidence=0.21531100478468898,
lift=3.0131489680782684)])
RelationRecord(items=frozenset({'frozen vegetables', 'shrimp', 'tomatoes'}),
support=0.003999466737768298,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'shrimp', 'tomatoes'}),
confidence=0.04195804195804196, lift=3.7467532467532467),
OrderedStatistic(items_base=frozenset({'shrimp'}), items_add=frozenset({'frozen
vegetables', 'tomatoes'}), confidence=0.055970149253731345,
lift=3.469686690514371), OrderedStatistic(items_base=frozenset({'tomatoes'}),
items_add=frozenset({'frozen vegetables', 'shrimp'}),
confidence=0.058479532163742694, lift=3.5092397660818713),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'shrimp'}),
items_add=frozenset({'tomatoes'}), confidence=0.24000000000000002,
lift=3.5092397660818717), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'tomatoes'}), items_add=frozenset({'shrimp'}),
confidence=0.2479338842975207, lift=3.4696866905143704),
OrderedStatistic(items_base=frozenset({'shrimp', 'tomatoes'}),
items_add=frozenset({'frozen vegetables'}), confidence=0.35714285714285715,
lift=3.7467532467532467)])
RelationRecord(items=frozenset({'frozen vegetables', 'tomatoes', 'spaghetti'}),
support=0.006665777896280496,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen

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vegetables'}), items_add=frozenset({'tomatoes', 'spaghetti'}),
confidence=0.06993006993006994, lift=3.341053850607991),
OrderedStatistic(items_base=frozenset({'tomatoes'}),
items_add=frozenset({'frozen vegetables', 'spaghetti'}),
confidence=0.09746588693957116, lift=3.4980460188216425),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'spaghetti'}),
items_add=frozenset({'tomatoes'}), confidence=0.23923444976076558,
lift=3.4980460188216425), OrderedStatistic(items_base=frozenset({'tomatoes',
'spaghetti'}), items_add=frozenset({'frozen vegetables'}),
confidence=0.3184713375796179, lift=3.341053850607991)])
RelationRecord(items=frozenset({'grated cheese', 'ground beef', 'spaghetti'}),
support=0.005332622317024397,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'grated cheese', 'spaghetti'}),
confidence=0.054274084124830396, lift=3.283144395325426),
OrderedStatistic(items_base=frozenset({'grated cheese', 'spaghetti'}),
items_add=frozenset({'ground beef'}), confidence=0.3225806451612903,
lift=3.283144395325426)])
RelationRecord(items=frozenset({'grated cheese', 'herb & pepper', 'spaghetti'}),
support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'grated cheese'}),
items_add=frozenset({'herb & pepper', 'spaghetti'}),
confidence=0.058524173027989825, lift=3.5982772285487843),
OrderedStatistic(items_base=frozenset({'herb & pepper'}),
items_add=frozenset({'grated cheese', 'spaghetti'}),
confidence=0.06199460916442048, lift=3.7501738979219197),
OrderedStatistic(items_base=frozenset({'grated cheese', 'spaghetti'}),
items_add=frozenset({'herb & pepper'}), confidence=0.18548387096774194,
lift=3.7501738979219197), OrderedStatistic(items_base=frozenset({'herb &
pepper', 'spaghetti'}), items_add=frozenset({'grated cheese'}),
confidence=0.18852459016393444, lift=3.5982772285487843)])
RelationRecord(items=frozenset({'ground beef', 'green tea', 'tomatoes'}),
support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'tomatoes'}),
items_add=frozenset({'green tea', 'ground beef'}),
confidence=0.04483430799220273, lift=3.0297490472929067),
OrderedStatistic(items_base=frozenset({'ground beef', 'green tea'}),
items_add=frozenset({'tomatoes'}), confidence=0.2072072072072072,
lift=3.0297490472929067)])
RelationRecord(items=frozenset({'milk', 'herb & pepper', 'ground beef'}),
support=0.0035995200639914677,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'milk', 'herb & pepper'}), confidence=0.036635006784260515,
lift=3.982596896938234), OrderedStatistic(items_base=frozenset({'herb &
pepper'}), items_add=frozenset({'milk', 'ground beef'}),
confidence=0.07277628032345013, lift=3.3084538103406027),
OrderedStatistic(items_base=frozenset({'milk', 'ground beef'}),
items_add=frozenset({'herb & pepper'}), confidence=0.16363636363636364,

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lift=3.3084538103406027), OrderedStatistic(items_base=frozenset({'milk', 'herb &
pepper'}), items_add=frozenset({'ground beef'}), confidence=0.3913043478260869,
lift=3.9825968969382335)])
RelationRecord(items=frozenset({'herb & pepper', 'ground beef', 'mineral
water'}), support=0.006665777896280496,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'herb & pepper', 'mineral water'}),
confidence=0.067842605156038, lift=3.9756826662143836),
OrderedStatistic(items_base=frozenset({'herb & pepper'}),
items_add=frozenset({'ground beef', 'mineral water'}),
confidence=0.1347708894878706, lift=3.292887433382793),
OrderedStatistic(items_base=frozenset({'ground beef', 'mineral water'}),
items_add=frozenset({'herb & pepper'}), confidence=0.16286644951140067,
lift=3.2928874333827935), OrderedStatistic(items_base=frozenset({'herb &
pepper', 'mineral water'}), items_add=frozenset({'ground beef'}),
confidence=0.39062500000000006, lift=3.975682666214383)])
RelationRecord(items=frozenset({'herb & pepper', 'ground beef', 'spaghetti'}),
support=0.006399146780429276,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'herb & pepper', 'spaghetti'}),
confidence=0.06512890094979648, lift=4.004359721511667),
OrderedStatistic(items_base=frozenset({'herb & pepper'}),
items_add=frozenset({'ground beef', 'spaghetti'}),
confidence=0.1293800539083558, lift=3.3009516475053635),
OrderedStatistic(items_base=frozenset({'ground beef', 'spaghetti'}),
items_add=frozenset({'herb & pepper'}), confidence=0.163265306122449,
lift=3.3009516475053635), OrderedStatistic(items_base=frozenset({'herb &
pepper', 'spaghetti'}), items_add=frozenset({'ground beef'}),
confidence=0.3934426229508197, lift=4.004359721511667)])
RelationRecord(items=frozenset({'milk', 'olive oil', 'ground beef'}),
support=0.004932675643247567,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'milk', 'ground beef'}), confidence=0.07489878542510121,
lift=3.4049441786283894), OrderedStatistic(items_base=frozenset({'milk', 'ground
beef'}), items_add=frozenset({'olive oil'}), confidence=0.224242424242427,
lift=3.40494417862839)])
RelationRecord(items=frozenset({'milk', 'soup', 'ground beef'}),
support=0.003999466737768298,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk'}),
items_add=frozenset({'ground beef', 'soup'}), confidence=0.030864197530864203,
lift=3.1714019956029094), OrderedStatistic(items_base=frozenset({'soup'}),
items_add=frozenset({'milk', 'ground beef'}), confidence=0.079155672823219,
lift=3.5984648596785807), OrderedStatistic(items_base=frozenset({'milk', 'ground
beef'}), items_add=frozenset({'soup'}), confidence=0.181818181818185,
lift=3.5984648596785807), OrderedStatistic(items_base=frozenset({'soup', 'ground
beef'}), items_add=frozenset({'milk'}), confidence=0.4109589041095891,
lift=3.1714019956029094)])
RelationRecord(items=frozenset({'pepper', 'ground beef', 'spaghetti'}),

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support=0.003332888948140248,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'pepper', 'spaghetti'}), confidence=0.033921302578019,
lift=3.438428251861088), OrderedStatistic(items_base=frozenset({'pepper'}),
items_add=frozenset({'ground beef', 'spaghetti'}),
confidence=0.12562814070351758, lift=3.2052268143438276),
OrderedStatistic(items_base=frozenset({'ground beef', 'spaghetti'}),
items_add=frozenset({'pepper'}), confidence=0.08503401360544217,
lift=3.2052268143438276), OrderedStatistic(items_base=frozenset({'pepper',
'spaghetti'}), items_add=frozenset({'ground beef'}),
confidence=0.33783783783783783, lift=3.4384282518610876)]]
RelationRecord(items=frozenset({'shrimp', 'ground beef', 'spaghetti'}),
support=0.005999200106652446,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'spaghetti'}),
items_add=frozenset({'shrimp', 'ground beef'}), confidence=0.03445635528330781,
lift=3.0053153602336264), OrderedStatistic(items_base=frozenset({'shrimp',
'ground beef'}), items_add=frozenset({'spaghetti'}),
confidence=0.5232558139534884, lift=3.005315360233627)]]
RelationRecord(items=frozenset({'tomato sauce', 'ground beef', 'spaghetti'}),
support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'tomato sauce', 'spaghetti'}),
confidence=0.03120759837177748, lift=4.980599901844742),
OrderedStatistic(items_base=frozenset({'spaghetti'}),
items_add=frozenset({'ground beef', 'tomato sauce'}),
confidence=0.01761102603369066, lift=3.302507656967841),
OrderedStatistic(items_base=frozenset({'tomato sauce'}),
items_add=frozenset({'ground beef', 'spaghetti'}),
confidence=0.2169811320754717, lift=5.535970992170453),
OrderedStatistic(items_base=frozenset({'ground beef', 'spaghetti'}),
items_add=frozenset({'tomato sauce'}), confidence=0.0782312925170068,
lift=5.535970992170453), OrderedStatistic(items_base=frozenset({'tomato sauce',
'ground beef'}), items_add=frozenset({'spaghetti'}),
confidence=0.5750000000000001, lift=3.3025076569678413),
OrderedStatistic(items_base=frozenset({'tomato sauce', 'spaghetti'}),
items_add=frozenset({'ground beef'}), confidence=0.4893617021276596,
lift=4.980599901844742)]]
RelationRecord(items=frozenset({'light cream', 'spaghetti', 'mineral water'}),
support=0.003199573390214638,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'light cream'}),
items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.20512820512820515, lift=3.4345238095238098),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'light cream'}), confidence=0.053571428571428575,
lift=3.4345238095238098)]]
RelationRecord(items=frozenset({'milk', 'soup', 'mineral water'}),
support=0.008532195707239034,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'soup'}),

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items_add=frozenset({'milk', 'mineral water'}), confidence=0.16886543535620052,
lift=3.518498973907945), OrderedStatistic(items_base=frozenset({'milk', 'mineral
water'}), items_add=frozenset({'soup'}), confidence=0.17777777777777776,
lift=3.5184989739079446)])
RelationRecord(items=frozenset({'milk', 'shrimp', 'olive oil'}),
support=0.003199573390214638,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk'}),
items_add=frozenset({'shrimp', 'olive oil'}), confidence=0.02469135802469136,
lift=3.0362274843149164), OrderedStatistic(items_base=frozenset({'shrimp',
'olive oil'}), items_add=frozenset({'milk'}), confidence=0.3934426229508197,
lift=3.0362274843149164)])
RelationRecord(items=frozenset({'milk', 'soup', 'olive oil'}),
support=0.0035995200639914677,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk'}),
items_add=frozenset({'olive oil', 'soup'}), confidence=0.02777777777777778,
lift=3.1098673300165838), OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'milk', 'soup'}), confidence=0.054655870445344125,
lift=3.596260387811634), OrderedStatistic(items_base=frozenset({'soup'}),
items_add=frozenset({'milk', 'olive oil'}), confidence=0.07124010554089709,
lift=4.174781497361478), OrderedStatistic(items_base=frozenset({'milk', 'olive
oil'}), items_add=frozenset({'soup'}), confidence=0.2109375,
lift=4.174781497361478), OrderedStatistic(items_base=frozenset({'milk',
'soup'}), items_add=frozenset({'olive oil'}), confidence=0.23684210526315788,
lift=3.5962603878116344), OrderedStatistic(items_base=frozenset({'soup', 'olive
oil'}), items_add=frozenset({'milk'}), confidence=0.4029850746268656,
lift=3.1098673300165833)])
RelationRecord(items=frozenset({'milk', 'olive oil', 'spaghetti'}),
support=0.007199040127982935,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'milk', 'spaghetti'}), confidence=0.10931174089068825,
lift=3.0825089038385434), OrderedStatistic(items_base=frozenset({'milk',
'spaghetti'}), items_add=frozenset({'olive oil'}),
confidence=0.20300751879699247, lift=3.0825089038385434)])
RelationRecord(items=frozenset({'milk', 'soup', 'tomatoes'}),
support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk'}),
items_add=frozenset({'soup', 'tomatoes'}), confidence=0.02366255144032922,
lift=3.4133230452674903), OrderedStatistic(items_base=frozenset({'soup'}),
items_add=frozenset({'milk', 'tomatoes'}), confidence=0.06068601583113457,
lift=4.335293378565146), OrderedStatistic(items_base=frozenset({'milk',
'tomatoes'}), items_add=frozenset({'soup'}), confidence=0.21904761904761905,
lift=4.335293378565146), OrderedStatistic(items_base=frozenset({'soup',
'tomatoes'}), items_add=frozenset({'milk'}), confidence=0.44230769230769235,
lift=3.4133230452674903)])
RelationRecord(items=frozenset({'milk', 'whole wheat pasta', 'spaghetti'}),
support=0.003999466737768298,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk'}),
items_add=frozenset({'whole wheat pasta', 'spaghetti'}),

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confidence=0.030864197530864203, lift=3.5077628133183696),
OrderedStatistic(items_base=frozenset({'whole wheat pasta'}),
items_add=frozenset({'milk', 'spaghetti'}), confidence=0.13574660633484165,
lift=3.8279522335249894), OrderedStatistic(items_base=frozenset({'milk',
'spaghetti'}), items_add=frozenset({'whole wheat pasta'}),
confidence=0.11278195488721805, lift=3.827952233524989),
OrderedStatistic(items_base=frozenset({'whole wheat pasta', 'spaghetti'}),
items_add=frozenset({'milk'}), confidence=0.4545454545454546,
lift=3.5077628133183696)])
RelationRecord(items=frozenset({'soup', 'olive oil', 'mineral water'}),
support=0.005199306759098787,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'soup', 'mineral water'}), confidence=0.07894736842105264,
lift=3.423030118649225), OrderedStatistic(items_base=frozenset({'soup'}),
items_add=frozenset({'olive oil', 'mineral water'}),
confidence=0.1029023746701847, lift=3.7288440212611373),
OrderedStatistic(items_base=frozenset({'olive oil', 'mineral water'}),
items_add=frozenset({'soup'}), confidence=0.18840579710144928,
lift=3.7288440212611373), OrderedStatistic(items_base=frozenset({'soup',
'mineral water'}), items_add=frozenset({'olive oil'}),
confidence=0.22543352601156072, lift=3.4230301186492245)])
RelationRecord(items=frozenset({'whole wheat pasta', 'olive oil', 'mineral
water'}), support=0.0038661511798426876,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'whole wheat pasta', 'mineral water'}),
confidence=0.058704453441295545, lift=6.115862573099415),
OrderedStatistic(items_base=frozenset({'whole wheat pasta'}),
items_add=frozenset({'olive oil', 'mineral water'}),
confidence=0.13122171945701358, lift=4.755044046604149),
OrderedStatistic(items_base=frozenset({'olive oil', 'mineral water'}),
items_add=frozenset({'whole wheat pasta'}), confidence=0.1400966183574879,
lift=4.755044046604148), OrderedStatistic(items_base=frozenset({'whole wheat
pasta', 'mineral water'}), items_add=frozenset({'olive oil'}),
confidence=0.4027777777777778, lift=6.115862573099416)])
RelationRecord(items=frozenset({'soup', 'tomatoes', 'mineral water'}),
support=0.0037328356219170776,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'soup'}),
items_add=frozenset({'tomatoes', 'mineral water'}),
confidence=0.07387862796833773, lift=3.0282163300027394),
OrderedStatistic(items_base=frozenset({'tomatoes', 'mineral water'}),
items_add=frozenset({'soup'}), confidence=0.15300546448087432,
lift=3.0282163300027394)])
RelationRecord(items=frozenset({'olive oil', 'pancakes', 'spaghetti'}),
support=0.005065991201173177,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'pancakes', 'spaghetti'}), confidence=0.07692307692307693,
lift=3.052910052910053), OrderedStatistic(items_base=frozenset({'pancakes',
'spaghetti'}), items_add=frozenset({'olive oil'}),

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confidence=0.20105820105820105, lift=3.0529100529100526)])
RelationRecord(items=frozenset({'olive oil', 'tomatoes', 'spaghetti'}),
support=0.004399413411545127,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'tomatoes', 'spaghetti'}), confidence=0.06680161943319839,
lift=3.1915856520281602), OrderedStatistic(items_base=frozenset({'spaghetti'}),
items_add=frozenset({'olive oil', 'tomatoes'}), confidence=0.02526799387442573,
lift=3.5099115194827295), OrderedStatistic(items_base=frozenset({'olive oil',
'tomatoes'}), items_add=frozenset({'spaghetti'}), confidence=0.6111111111111112,
lift=3.5099115194827295), OrderedStatistic(items_base=frozenset({'tomatoes',
'spaghetti'}), items_add=frozenset({'olive oil'}),
confidence=0.21019108280254778, lift=3.19158565202816)])
RelationRecord(items=frozenset({'whole wheat rice', 'tomatoes', 'spaghetti'}),
support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'tomatoes'}),
items_add=frozenset({'whole wheat rice', 'spaghetti'}),
confidence=0.04483430799220273, lift=3.1726617382029496),
OrderedStatistic(items_base=frozenset({'whole wheat rice', 'spaghetti'}),
items_add=frozenset({'tomatoes'}), confidence=0.2169811320754717,
lift=3.1726617382029496)])
RelationRecord(items=frozenset({'milk', 'spaghetti', '0', 'avocado'}),
support=0.003332888948140248,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk'}),
items_add=frozenset({'0', 'spaghetti', 'avocado'}),
confidence=0.025720164609053502, lift=3.2154492455418384),
OrderedStatistic(items_base=frozenset({'milk', '0'}),
items_add=frozenset({'spaghetti', 'avocado'}), confidence=0.025720164609053502,
lift=3.2154492455418384), OrderedStatistic(items_base=frozenset({'spaghetti',
'avocado'}), items_add=frozenset({'milk', '0'}), confidence=0.41666666666666663,
lift=3.215449245541838), OrderedStatistic(items_base=frozenset({'spaghetti',
'0', 'avocado'}), items_add=frozenset({'milk'}), confidence=0.41666666666666663,
lift=3.215449245541838)])
RelationRecord(items=frozenset({'milk', 'cake', '0', 'burgers'}),
support=0.0037328356219170776,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'burgers'}),
items_add=frozenset({'milk', 'cake', '0'}), confidence=0.04281345565749235,
lift=3.211437308868501), OrderedStatistic(items_base=frozenset({'0',
'burgers'}), items_add=frozenset({'milk', 'cake'}),
confidence=0.04281345565749235, lift=3.211437308868501),
OrderedStatistic(items_base=frozenset({'milk', 'cake'}),
items_add=frozenset({'0', 'burgers'}), confidence=0.27999999999999997,
lift=3.211437308868501), OrderedStatistic(items_base=frozenset({'milk', 'cake',
'0'}), items_add=frozenset({'burgers'}), confidence=0.27999999999999997,
lift=3.211437308868501)])
RelationRecord(items=frozenset({'chocolate', 'turkey', '0', 'burgers'}),
support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'burgers'}),
items_add=frozenset({'chocolate', '0', 'turkey'}),

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confidence=0.035168195718654434, lift=3.1034898363014927),
OrderedStatistic(items_base=frozenset({'0', 'burgers'}),
items_add=frozenset({'chocolate', 'turkey'}), confidence=0.035168195718654434,
lift=3.1034898363014927), OrderedStatistic(items_base=frozenset({'chocolate',
'turkey'}), items_add=frozenset({'0', 'burgers'}),
confidence=0.27058823529411763, lift=3.1034898363014927),
OrderedStatistic(items_base=frozenset({'chocolate', '0', 'turkey'}),
items_add=frozenset({'burgers'}), confidence=0.27058823529411763,
lift=3.1034898363014927)])
RelationRecord(items=frozenset({'milk', 'turkey', '0', 'burgers'}),
support=0.003199573390214638,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'burgers'}),
items_add=frozenset({'milk', '0', 'turkey'}), confidence=0.03669724770642202,
lift=3.2384241770102538), OrderedStatistic(items_base=frozenset({'0',
'burgers'}), items_add=frozenset({'milk', 'turkey'}),
confidence=0.03669724770642202, lift=3.2384241770102538),
OrderedStatistic(items_base=frozenset({'milk', 'turkey'}),
items_add=frozenset({'0', 'burgers'}), confidence=0.2823529411764706,
lift=3.2384241770102533), OrderedStatistic(items_base=frozenset({'milk', '0',
'turkey'}), items_add=frozenset({'burgers'}), confidence=0.2823529411764706,
lift=3.2384241770102533)])
RelationRecord(items=frozenset({'frozen vegetables', 'tomatoes', 'cake', '0'}),
support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'0', 'cake', 'tomatoes'}),
confidence=0.03216783216783217, lift=3.83001443001443),
OrderedStatistic(items_base=frozenset({'tomatoes'}),
items_add=frozenset({'frozen vegetables', 'cake', '0'}),
confidence=0.04483430799220273, lift=4.367560314928736),
OrderedStatistic(items_base=frozenset({'frozen vegetables', '0'}),
items_add=frozenset({'cake', 'tomatoes'}), confidence=0.03216783216783217,
lift=3.83001443001443), OrderedStatistic(items_base=frozenset({'tomatoes',
'0'}), items_add=frozenset({'frozen vegetables', 'cake'}),
confidence=0.04483430799220273, lift=4.367560314928736),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'cake'}),
items_add=frozenset({'0', 'tomatoes'}), confidence=0.2987012987012987,
lift=4.367560314928736), OrderedStatistic(items_base=frozenset({'cake',
'tomatoes'}), items_add=frozenset({'frozen vegetables', '0'}),
confidence=0.36507936507936506, lift=3.8300144300144296),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'cake', '0'}),
items_add=frozenset({'tomatoes'}), confidence=0.2987012987012987,
lift=4.367560314928736), OrderedStatistic(items_base=frozenset({'tomatoes',
'cake', '0'}), items_add=frozenset({'frozen vegetables'}),
confidence=0.36507936507936506, lift=3.8300144300144296)])
RelationRecord(items=frozenset({'cereals', 'ground beef', '0', 'spaghetti'}),
support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'cereals'}),
items_add=frozenset({'ground beef', '0', 'spaghetti'}),

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confidence=0.11917098445595856, lift=3.040481477565119),
OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'0', 'cereals', 'spaghetti'}),
confidence=0.03120759837177748, lift=4.681763907734057),
OrderedStatistic(items_base=frozenset({'spaghetti'}), items_add=frozenset({'0',
'ground beef', 'cereals'}), confidence=0.01761102603369066,
lift=3.885303125844519), OrderedStatistic(items_base=frozenset({'cereals',
'0'}), items_add=frozenset({'ground beef', 'spaghetti'}),
confidence=0.11917098445595856, lift=3.040481477565119),
OrderedStatistic(items_base=frozenset({'ground beef', '0'}),
items_add=frozenset({'cereals', 'spaghetti'}), confidence=0.03120759837177748,
lift=4.681763907734057), OrderedStatistic(items_base=frozenset({'0',
'spaghetti'}), items_add=frozenset({'ground beef', 'cereals'}),
confidence=0.01761102603369066, lift=3.885303125844519),
OrderedStatistic(items_base=frozenset({'ground beef', 'cereals'}),
items_add=frozenset({'0', 'spaghetti'}), confidence=0.6764705882352942,
lift=3.8853031258445188), OrderedStatistic(items_base=frozenset({'cereals',
'spaghetti'}), items_add=frozenset({'ground beef', '0'}),
confidence=0.45999999999999996, lift=4.681763907734057),
OrderedStatistic(items_base=frozenset({'ground beef', 'spaghetti'}),
items_add=frozenset({'0', 'cereals'}), confidence=0.0782312925170068,
lift=3.0404814775651197), OrderedStatistic(items_base=frozenset({'cereals',
'ground beef', '0'}), items_add=frozenset({'spaghetti'}),
confidence=0.6764705882352942, lift=3.8853031258445188),
OrderedStatistic(items_base=frozenset({'cereals', '0', 'spaghetti'}),
items_add=frozenset({'ground beef'}), confidence=0.45999999999999996,
lift=4.681763907734057), OrderedStatistic(items_base=frozenset({'ground beef',
'0', 'spaghetti'}), items_add=frozenset({'cereals'}),
confidence=0.0782312925170068, lift=3.0404814775651197)])
RelationRecord(items=frozenset({'milk', 'ground beef', 'chicken', '0'}),
support=0.0038661511798426876,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk'}),
items_add=frozenset({'ground beef', 'chicken', '0'}),
confidence=0.02983539094650206, lift=3.1520460209818584),
OrderedStatistic(items_base=frozenset({'milk', '0'}),
items_add=frozenset({'ground beef', 'chicken'}), confidence=0.02983539094650206,
lift=3.1520460209818584), OrderedStatistic(items_base=frozenset({'ground beef',
'chicken'}), items_add=frozenset({'milk', '0'}), confidence=0.40845070422535207,
lift=3.152046020981858), OrderedStatistic(items_base=frozenset({'ground beef',
'chicken', '0'}), items_add=frozenset({'milk'}), confidence=0.40845070422535207,
lift=3.152046020981858)])
RelationRecord(items=frozenset({'milk', 'olive oil', 'chicken', '0'}),
support=0.0035995200639914677,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'chicken'}),
items_add=frozenset({'milk', 'olive oil', '0'}), confidence=0.06,
lift=3.51609375), OrderedStatistic(items_base=frozenset({'milk'}),
items_add=frozenset({'olive oil', 'chicken', '0'}),
confidence=0.027777777777777778, lift=3.8585390946502063),

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OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'milk', 'chicken', '0'}), confidence=0.054655870445344125,
lift=3.6934566145092456), OrderedStatistic(items_base=frozenset({'chicken',
'0'}), items_add=frozenset({'milk', 'olive oil'}), confidence=0.06,
lift=3.51609375), OrderedStatistic(items_base=frozenset({'milk', '0'}),
items_add=frozenset({'olive oil', 'chicken'}), confidence=0.027777777777777778,
lift=3.8585390946502063), OrderedStatistic(items_base=frozenset({'olive oil',
'0'}), items_add=frozenset({'milk', 'chicken'}),
confidence=0.054766734279918856, lift=3.7009484129159578),
OrderedStatistic(items_base=frozenset({'milk', 'chicken'}),
items_add=frozenset({'olive oil', '0'}), confidence=0.24324324324324323,
lift=3.700948412915958), OrderedStatistic(items_base=frozenset({'olive oil',
'chicken'}), items_add=frozenset({'milk', '0'}), confidence=0.5,
lift=3.858539094650206), OrderedStatistic(items_base=frozenset({'milk', 'olive
oil'}), items_add=frozenset({'chicken', '0'}), confidence=0.2109375,
lift=3.51609375), OrderedStatistic(items_base=frozenset({'milk', 'chicken',
'0'}), items_add=frozenset({'olive oil'}), confidence=0.24324324324324323,
lift=3.693456614509246), OrderedStatistic(items_base=frozenset({'olive oil',
'chicken', '0'}), items_add=frozenset({'milk'}), confidence=0.5,
lift=3.858539094650206), OrderedStatistic(items_base=frozenset({'milk', 'olive
oil', '0'}), items_add=frozenset({'chicken'}), confidence=0.2109375,
lift=3.51609375)])
RelationRecord(items=frozenset({'milk', 'pancakes', 'chicken', '0'}),
support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'chicken'}),
items_add=frozenset({'milk', '0', 'pancakes'}), confidence=0.051111111111111114,
lift=3.091810035842294), OrderedStatistic(items_base=frozenset({'chicken',
'0'}), items_add=frozenset({'milk', 'pancakes'}),
confidence=0.051111111111111114, lift=3.091810035842294),
OrderedStatistic(items_base=frozenset({'milk', 'pancakes'}),
items_add=frozenset({'chicken', '0'}), confidence=0.18548387096774194,
lift=3.091810035842294), OrderedStatistic(items_base=frozenset({'milk',
'pancakes', '0'}), items_add=frozenset({'chicken'}),
confidence=0.18548387096774194, lift=3.091810035842294)])
RelationRecord(items=frozenset({'olive oil', 'chicken', '0', 'spaghetti'}),
support=0.0034662045060658577,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'chicken', '0', 'spaghetti'}),
confidence=0.05263157894736842, lift=3.0603835169318647),
OrderedStatistic(items_base=frozenset({'olive oil', '0'}),
items_add=frozenset({'chicken', 'spaghetti'}), confidence=0.052738336713995936,
lift=3.0665911914083996), OrderedStatistic(items_base=frozenset({'chicken',
'spaghetti'}), items_add=frozenset({'olive oil', '0'}),
confidence=0.20155038759689922, lift=3.0665911914083996),
OrderedStatistic(items_base=frozenset({'chicken', '0', 'spaghetti'}),
items_add=frozenset({'olive oil'}), confidence=0.20155038759689922,
lift=3.0603835169318647)])
RelationRecord(items=frozenset({'frozen vegetables', 'chocolate', 'shrimp',

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'0'}), support=0.005332622317024397,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'chocolate', 'shrimp', '0'}),
confidence=0.055944055944055944, lift=3.1084175084175087),
OrderedStatistic(items_base=frozenset({'shrimp'}), items_add=frozenset({'frozen
vegetables', 'chocolate', '0'}), confidence=0.07462686567164178,
lift=3.2545123221103784), OrderedStatistic(items_base=frozenset({'frozen
vegetables', '0'}), items_add=frozenset({'chocolate', 'shrimp'}),
confidence=0.055944055944055944, lift=3.1084175084175087),
OrderedStatistic(items_base=frozenset({'shrimp', '0'}),
items_add=frozenset({'frozen vegetables', 'chocolate'}),
confidence=0.07476635514018692, lift=3.2605955227124546),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'chocolate'}),
items_add=frozenset({'shrimp', '0'}), confidence=0.23255813953488375,
lift=3.260595522712454), OrderedStatistic(items_base=frozenset({'chocolate',
'shrimp'}), items_add=frozenset({'frozen vegetables', '0'}),
confidence=0.29629629629629634, lift=3.1084175084175087),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'chocolate', '0'}),
items_add=frozenset({'shrimp'}), confidence=0.23255813953488375,
lift=3.2545123221103784), OrderedStatistic(items_base=frozenset({'chocolate',
'shrimp', '0'}), items_add=frozenset({'frozen vegetables'}),
confidence=0.29629629629629634, lift=3.1084175084175087)]]
RelationRecord(items=frozenset({'chocolate', 'herb & pepper', 'ground beef',
'0'}), support=0.003999466737768298,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'chocolate', 'herb & pepper', '0'}),
confidence=0.0407055630936228, lift=4.490182775959774),
OrderedStatistic(items_base=frozenset({'herb & pepper'}),
items_add=frozenset({'chocolate', 'ground beef', '0'}),
confidence=0.08086253369272238, lift=3.5060685851393676),
OrderedStatistic(items_base=frozenset({'ground beef', '0'}),
items_add=frozenset({'chocolate', 'herb & pepper'}),
confidence=0.0407055630936228, lift=4.490182775959774),
OrderedStatistic(items_base=frozenset({'herb & pepper', '0'}),
items_add=frozenset({'chocolate', 'ground beef'}),
confidence=0.08086253369272238, lift=3.5060685851393676),
OrderedStatistic(items_base=frozenset({'chocolate', 'ground beef'}),
items_add=frozenset({'herb & pepper', '0'}), confidence=0.17341040462427748,
lift=3.5060685851393676), OrderedStatistic(items_base=frozenset({'chocolate',
'herb & pepper'}), items_add=frozenset({'ground beef', '0'}),
confidence=0.4411764705882354, lift=4.4901827759597746),
OrderedStatistic(items_base=frozenset({'chocolate', 'ground beef', '0'}),
items_add=frozenset({'herb & pepper'}), confidence=0.17341040462427748,
lift=3.5060685851393676), OrderedStatistic(items_base=frozenset({'chocolate',
'herb & pepper', '0'}), items_add=frozenset({'ground beef'}),
confidence=0.4411764705882354, lift=4.4901827759597746)]]
RelationRecord(items=frozenset({'milk', 'chocolate', 'soup', '0'}),
support=0.003999466737768298,

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ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk'}),
items_add=frozenset({'chocolate', 'soup', '0'}),
confidence=0.030864197530864203, lift=3.0462150747238472),
OrderedStatistic(items_base=frozenset({'milk', '0'}),
items_add=frozenset({'chocolate', 'soup'}), confidence=0.030864197530864203,
lift=3.0462150747238472), OrderedStatistic(items_base=frozenset({'chocolate',
'soup'}), items_add=frozenset({'milk', '0'}), confidence=0.3947368421052632,
lift=3.0462150747238472), OrderedStatistic(items_base=frozenset({'chocolate',
'soup', '0'}), items_add=frozenset({'milk'}), confidence=0.3947368421052632,
lift=3.0462150747238472)]]
RelationRecord(items=frozenset({'cooking oil', 'ground beef', '0',
'spaghetti'}), support=0.004799360085321957,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'cooking oil', '0', 'spaghetti'}),
confidence=0.048846675712347354, lift=3.078982474943844),
OrderedStatistic(items_base=frozenset({'spaghetti'}),
items_add=frozenset({'cooking oil', 'ground beef', '0'}),
confidence=0.027565084226646247, lift=3.2819951870487856),
OrderedStatistic(items_base=frozenset({'ground beef', '0'}),
items_add=frozenset({'cooking oil', 'spaghetti'}),
confidence=0.048846675712347354, lift=3.078982474943844),
OrderedStatistic(items_base=frozenset({'0', 'spaghetti'}),
items_add=frozenset({'cooking oil', 'ground beef'}),
confidence=0.027565084226646247, lift=3.2819951870487856),
OrderedStatistic(items_base=frozenset({'cooking oil', 'ground beef'}),
items_add=frozenset({'0', 'spaghetti'}), confidence=0.5714285714285714,
lift=3.2819951870487856), OrderedStatistic(items_base=frozenset({'cooking oil',
'spaghetti'}), items_add=frozenset({'ground beef', '0'}),
confidence=0.3025210084033613, lift=3.0789824749438446),
OrderedStatistic(items_base=frozenset({'cooking oil', 'ground beef', '0'}),
items_add=frozenset({'spaghetti'}), confidence=0.5714285714285714,
lift=3.2819951870487856), OrderedStatistic(items_base=frozenset({'cooking oil',
'0', 'spaghetti'}), items_add=frozenset({'ground beef'}),
confidence=0.3025210084033613, lift=3.0789824749438446)]]
RelationRecord(items=frozenset({'eggs', 'herb & pepper', 'ground beef', '0'}),
support=0.0041327822956939075,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'eggs', 'herb & pepper', '0'}),
confidence=0.04206241519674356, lift=3.3564912381997174),
OrderedStatistic(items_base=frozenset({'herb & pepper'}),
items_add=frozenset({'eggs', 'ground beef', '0'}),
confidence=0.08355795148247978, lift=4.178454627133872),
OrderedStatistic(items_base=frozenset({'ground beef', '0'}),
items_add=frozenset({'eggs', 'herb & pepper'}), confidence=0.04206241519674356,
lift=3.3564912381997174), OrderedStatistic(items_base=frozenset({'herb &
pepper', '0'}), items_add=frozenset({'eggs', 'ground beef'}),
confidence=0.08355795148247978, lift=4.178454627133872),
OrderedStatistic(items_base=frozenset({'eggs', 'ground beef'}),

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items_add=frozenset({'herb & pepper', '0'}), confidence=0.2066666666666667,
lift=4.178454627133872), OrderedStatistic(items_base=frozenset({'eggs', 'herb &
pepper'}), items_add=frozenset({'ground beef', '0'}),
confidence=0.3297872340425532, lift=3.3564912381997174),
OrderedStatistic(items_base=frozenset({'eggs', 'ground beef', '0'}),
items_add=frozenset({'herb & pepper'}), confidence=0.2066666666666667,
lift=4.178454627133872), OrderedStatistic(items_base=frozenset({'eggs', 'herb &
pepper', '0'}), items_add=frozenset({'ground beef'}),
confidence=0.3297872340425532, lift=3.3564912381997174)])
RelationRecord(items=frozenset({'eggs', 'red wine', '0', 'spaghetti'}),
support=0.0037328356219170776,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'red wine'}),
items_add=frozenset({'eggs', '0', 'spaghetti'}), confidence=0.13270142180094788,
lift=3.6328224997405476), OrderedStatistic(items_base=frozenset({'spaghetti'}),
items_add=frozenset({'eggs', '0', 'red wine'}), confidence=0.021439509954058193,
lift=3.0342974370828397), OrderedStatistic(items_base=frozenset({'red wine',
'0'}), items_add=frozenset({'eggs', 'spaghetti'}),
confidence=0.13270142180094788, lift=3.6328224997405476),
OrderedStatistic(items_base=frozenset({'0', 'spaghetti'}),
items_add=frozenset({'eggs', 'red wine'}), confidence=0.021439509954058193,
lift=3.0342974370828397), OrderedStatistic(items_base=frozenset({'eggs', 'red
wine'}), items_add=frozenset({'0', 'spaghetti'}), confidence=0.5283018867924528,
lift=3.0342974370828397), OrderedStatistic(items_base=frozenset({'eggs',
'spaghetti'}), items_add=frozenset({'0', 'red wine'}),
confidence=0.10218978102189781, lift=3.632822499740547),
OrderedStatistic(items_base=frozenset({'eggs', 'red wine', '0'}),
items_add=frozenset({'spaghetti'}), confidence=0.5283018867924528,
lift=3.0342974370828397), OrderedStatistic(items_base=frozenset({'eggs', '0',
'spaghetti'}), items_add=frozenset({'red wine'}),
confidence=0.10218978102189781, lift=3.632822499740547)])
RelationRecord(items=frozenset({'herb & pepper', 'ground beef', '0', 'french
fries'}), support=0.003199573390214638,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'herb & pepper', '0', 'french fries'}),
confidence=0.03256445047489824, lift=4.697421981004071),
OrderedStatistic(items_base=frozenset({'herb & pepper'}),
items_add=frozenset({'ground beef', '0', 'french fries'}),
confidence=0.0646900269541779, lift=4.665768194070082),
OrderedStatistic(items_base=frozenset({'ground beef', '0'}),
items_add=frozenset({'herb & pepper', 'french fries'}),
confidence=0.03256445047489824, lift=4.697421981004071),
OrderedStatistic(items_base=frozenset({'herb & pepper', '0'}),
items_add=frozenset({'ground beef', 'french fries'}),
confidence=0.0646900269541779, lift=4.665768194070082),
OrderedStatistic(items_base=frozenset({'ground beef', 'french fries'}),
items_add=frozenset({'herb & pepper', '0'}), confidence=0.23076923076923078,
lift=4.665768194070081), OrderedStatistic(items_base=frozenset({'herb & pepper',
'french fries'}), items_add=frozenset({'ground beef', '0'}),

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confidence=0.46153846153846156, lift=4.697421981004071),
OrderedStatistic(items_base=frozenset({'ground beef', '0', 'french fries'}),
items_add=frozenset({'herb & pepper'}), confidence=0.23076923076923078,
lift=4.665768194070081), OrderedStatistic(items_base=frozenset({'herb & pepper',
'0', 'french fries'}), items_add=frozenset({'ground beef'}),
confidence=0.46153846153846156, lift=4.697421981004071)])
RelationRecord(items=frozenset({'frozen vegetables', 'green tea', 'tomatoes',
'0'}), support=0.003332888948140248,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'tomatoes'}),
items_add=frozenset({'frozen vegetables', 'green tea', '0'}),
confidence=0.04873294346978558, lift=3.38468341635983),
OrderedStatistic(items_base=frozenset({'tomatoes', '0'}),
items_add=frozenset({'frozen vegetables', 'green tea'}),
confidence=0.04873294346978558, lift=3.38468341635983),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'green tea'}),
items_add=frozenset({'0', 'tomatoes'}), confidence=0.2314814814814815,
lift=3.38468341635983), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'green tea', '0'}), items_add=frozenset({'tomatoes'}),
confidence=0.2314814814814815, lift=3.38468341635983)])
RelationRecord(items=frozenset({'frozen vegetables', 'ground beef', '0',
'spaghetti'}), support=0.008665511265164644,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'frozen vegetables', '0', 'spaghetti'}),
confidence=0.08819538670284939, lift=3.165328208890303),
OrderedStatistic(items_base=frozenset({'ground beef', '0'}),
items_add=frozenset({'frozen vegetables', 'spaghetti'}),
confidence=0.08819538670284939, lift=3.165328208890303),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'spaghetti'}),
items_add=frozenset({'ground beef', '0'}), confidence=0.31100478468899523,
lift=3.165328208890303), OrderedStatistic(items_base=frozenset({'frozen
vegetables', '0', 'spaghetti'}), items_add=frozenset({'ground beef'}),
confidence=0.31100478468899523, lift=3.165328208890303)])
RelationRecord(items=frozenset({'frozen vegetables', 'milk', 'olive oil', '0'}),
support=0.004799360085321957,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk'}),
items_add=frozenset({'frozen vegetables', 'olive oil', '0'}),
confidence=0.037037037037037035, lift=3.2684095860566447),
OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'frozen vegetables', 'milk', '0'}),
confidence=0.0728744939271255, lift=3.0883140053523634),
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items_add=frozenset({'frozen vegetables', 'olive oil'}),
confidence=0.037037037037037035, lift=3.2684095860566447),
OrderedStatistic(items_base=frozenset({'olive oil', '0'}),
items_add=frozenset({'frozen vegetables', 'milk'}),
confidence=0.07302231237322514, lift=3.0945783339636255),
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items_add=frozenset({'olive oil', '0'}), confidence=0.20338983050847456,

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lift=3.094578333963626), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'olive oil'}), items_add=frozenset({'milk', '0'}),
confidence=0.4235294117647058, lift=3.2684095860566447),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk', '0'}),
items_add=frozenset({'olive oil'}), confidence=0.20338983050847456,
lift=3.088314005352364), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'olive oil', '0'}), items_add=frozenset({'milk'}),
confidence=0.4235294117647058, lift=3.2684095860566447)])
RelationRecord(items=frozenset({'frozen vegetables', 'milk', 'soup', '0'}),
support=0.003999466737768298,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk'}),
items_add=frozenset({'frozen vegetables', 'soup', '0'}),
confidence=0.030864197530864203, lift=3.858539094650206),
OrderedStatistic(items_base=frozenset({'soup'}), items_add=frozenset({'frozen
vegetables', 'milk', '0'}), confidence=0.079155672823219,
lift=3.3545011403783374), OrderedStatistic(items_base=frozenset({'milk', '0'}),
items_add=frozenset({'frozen vegetables', 'soup'}),
confidence=0.030864197530864203, lift=3.858539094650206),
OrderedStatistic(items_base=frozenset({'soup', '0'}),
items_add=frozenset({'frozen vegetables', 'milk'}),
confidence=0.079155672823219, lift=3.3545011403783374),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk'}),
items_add=frozenset({'soup', '0'}), confidence=0.16949152542372883,
lift=3.354501140378338), OrderedStatistic(items_base=frozenset({'frozen
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lift=3.858539094650206), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'milk', '0'}), items_add=frozenset({'soup'}),
confidence=0.16949152542372883, lift=3.354501140378338),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'soup', '0'}),
items_add=frozenset({'milk'}), confidence=0.5, lift=3.858539094650206)])
RelationRecord(items=frozenset({'frozen vegetables', 'milk', 'tomatoes', '0'}),
support=0.0041327822956939075,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'milk', '0', 'tomatoes'}),
confidence=0.043356643356643354, lift=3.0973160173160172),
OrderedStatistic(items_base=frozenset({'frozen vegetables', '0'}),
items_add=frozenset({'milk', 'tomatoes'}), confidence=0.043356643356643354,
lift=3.0973160173160172), OrderedStatistic(items_base=frozenset({'milk',
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confidence=0.29523809523809524, lift=3.0973160173160172),
OrderedStatistic(items_base=frozenset({'milk', 'tomatoes', '0'}),
items_add=frozenset({'frozen vegetables'}), confidence=0.29523809523809524,
lift=3.0973160173160172)])
RelationRecord(items=frozenset({'frozen vegetables', 'shrimp', '0', 'mineral
water'}), support=0.007199040127982935,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'shrimp', '0', 'mineral water'}),
confidence=0.07552447552447553, lift=3.218801652892562),

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OrderedStatistic(items_base=frozenset({'frozen vegetables', '0'}),
items_add=frozenset({'shrimp', 'mineral water'}),
confidence=0.07552447552447553, lift=3.2006163328197226),
OrderedStatistic(items_base=frozenset({'shrimp', 'mineral water'}),
items_add=frozenset({'frozen vegetables', '0'}), confidence=0.30508474576271183,
lift=3.200616332819722), OrderedStatistic(items_base=frozenset({'shrimp', '0',
'mineral water'}), items_add=frozenset({'frozen vegetables'}),
confidence=0.3068181818181818, lift=3.218801652892562)])
RelationRecord(items=frozenset({'frozen vegetables', 'olive oil', '0',
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'frozen vegetables', '0', 'spaghetti'}),
confidence=0.08704453441295547, lift=3.124024175270713),
OrderedStatistic(items_base=frozenset({'olive oil', '0'}),
items_add=frozenset({'frozen vegetables', 'spaghetti'}),
confidence=0.08722109533468558, lift=3.1303609383037156),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'spaghetti'}),
items_add=frozenset({'olive oil', '0'}), confidence=0.20574162679425836,
lift=3.1303609383037156), OrderedStatistic(items_base=frozenset({'frozen
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confidence=0.20574162679425836, lift=3.1240241752707125)])
RelationRecord(items=frozenset({'frozen vegetables', 'shrimp', '0',
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items_add=frozenset({'frozen vegetables', '0', 'spaghetti'}),
confidence=0.08395522388059701, lift=3.013148968078269),
OrderedStatistic(items_base=frozenset({'shrimp', '0'}),
items_add=frozenset({'frozen vegetables', 'spaghetti'}),
confidence=0.08411214953271028, lift=3.0187810222242097),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'spaghetti'}),
items_add=frozenset({'shrimp', '0'}), confidence=0.21531100478468898,
lift=3.0187810222242093), OrderedStatistic(items_base=frozenset({'frozen
vegetables', '0', 'spaghetti'}), items_add=frozenset({'shrimp'}),
confidence=0.21531100478468898, lift=3.0131489680782684)])
RelationRecord(items=frozenset({'frozen vegetables', 'shrimp', 'tomatoes',
'0'}), support=0.003999466737768298,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'shrimp', '0', 'tomatoes'}),
confidence=0.04195804195804196, lift=3.7467532467532467),
OrderedStatistic(items_base=frozenset({'shrimp'}), items_add=frozenset({'frozen
vegetables', '0', 'tomatoes'}), confidence=0.055970149253731345,
lift=3.469686690514371), OrderedStatistic(items_base=frozenset({'tomatoes'}),
items_add=frozenset({'frozen vegetables', 'shrimp', '0'}),
confidence=0.058479532163742694, lift=3.5092397660818713),
OrderedStatistic(items_base=frozenset({'frozen vegetables', '0'}),
items_add=frozenset({'shrimp', 'tomatoes'}), confidence=0.04195804195804196,
lift=3.7467532467532467), OrderedStatistic(items_base=frozenset({'shrimp',
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confidence=0.05607476635514019, lift=3.4761720861975753),
OrderedStatistic(items_base=frozenset({'tomatoes', '0'}),
items_add=frozenset({'frozen vegetables', 'shrimp'}),
confidence=0.058479532163742694, lift=3.5092397660818713),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'shrimp'}),
items_add=frozenset({'0', 'tomatoes'}), confidence=0.24000000000000002,
lift=3.5092397660818717), OrderedStatistic(items_base=frozenset({'frozen
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confidence=0.2479338842975207, lift=3.4761720861975753),
OrderedStatistic(items_base=frozenset({'shrimp', 'tomatoes'}),
items_add=frozenset({'frozen vegetables', '0'}), confidence=0.35714285714285715,
lift=3.7467532467532467), OrderedStatistic(items_base=frozenset({'frozen
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confidence=0.24000000000000002, lift=3.5092397660818717),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'tomatoes', '0'}),
items_add=frozenset({'shrimp'}), confidence=0.2479338842975207,
lift=3.4696866905143704), OrderedStatistic(items_base=frozenset({'shrimp',
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confidence=0.35714285714285715, lift=3.7467532467532467)])
RelationRecord(items=frozenset({'frozen vegetables', 'tomatoes', '0',
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
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confidence=0.06993006993006994, lift=3.341053850607991),
OrderedStatistic(items_base=frozenset({'tomatoes'}),
items_add=frozenset({'frozen vegetables', '0', 'spaghetti'}),
confidence=0.09746588693957116, lift=3.4980460188216425),
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items_add=frozenset({'tomatoes', 'spaghetti'}), confidence=0.06993006993006994,
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items_add=frozenset({'0', 'tomatoes'}), confidence=0.23923444976076558,
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confidence=0.3184713375796179, lift=3.341053850607991),
OrderedStatistic(items_base=frozenset({'frozen vegetables', '0', 'spaghetti'}),
items_add=frozenset({'tomatoes'}), confidence=0.23923444976076558,
lift=3.4980460188216425), OrderedStatistic(items_base=frozenset({'tomatoes',
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confidence=0.3184713375796179, lift=3.341053850607991)])
RelationRecord(items=frozenset({'grated cheese', 'ground beef', '0',
'spaghetti'}), support=0.005332622317024397,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'grated cheese', '0', 'spaghetti'}),
confidence=0.054274084124830396, lift=3.283144395325426),
OrderedStatistic(items_base=frozenset({'ground beef', '0'}),

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items_add=frozenset({'grated cheese', 'spaghetti'}),
confidence=0.054274084124830396, lift=3.283144395325426),
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items_add=frozenset({'ground beef', '0'}), confidence=0.3225806451612903,
lift=3.283144395325426), OrderedStatistic(items_base=frozenset({'grated cheese',
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confidence=0.3225806451612903, lift=3.283144395325426)])
RelationRecord(items=frozenset({'grated cheese', 'herb & pepper', '0',
'spaghetti'}), support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'grated cheese'}),
items_add=frozenset({'herb & pepper', '0', 'spaghetti'}),
confidence=0.058524173027989825, lift=3.5982772285487843),
OrderedStatistic(items_base=frozenset({'herb & pepper'}),
items_add=frozenset({'grated cheese', '0', 'spaghetti'}),
confidence=0.06199460916442048, lift=3.7501738979219197),
OrderedStatistic(items_base=frozenset({'grated cheese', '0'}),
items_add=frozenset({'herb & pepper', 'spaghetti'}),
confidence=0.058524173027989825, lift=3.5982772285487843),
OrderedStatistic(items_base=frozenset({'herb & pepper', '0'}),
items_add=frozenset({'grated cheese', 'spaghetti'}),
confidence=0.06199460916442048, lift=3.7501738979219197),
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items_add=frozenset({'herb & pepper', '0'}), confidence=0.18548387096774194,
lift=3.7501738979219197), OrderedStatistic(items_base=frozenset({'herb &
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confidence=0.18852459016393444, lift=3.5982772285487843),
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items_add=frozenset({'herb & pepper'}), confidence=0.18548387096774194,
lift=3.7501738979219197), OrderedStatistic(items_base=frozenset({'herb &
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confidence=0.18852459016393444, lift=3.5982772285487843)])
RelationRecord(items=frozenset({'ground beef', 'green tea', 'tomatoes', '0'}),
support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'tomatoes'}),
items_add=frozenset({'green tea', 'ground beef', '0'}),
confidence=0.04483430799220273, lift=3.0297490472929067),
OrderedStatistic(items_base=frozenset({'tomatoes', '0'}),
items_add=frozenset({'green tea', 'ground beef'}),
confidence=0.04483430799220273, lift=3.0297490472929067),
OrderedStatistic(items_base=frozenset({'ground beef', 'green tea'}),
items_add=frozenset({'0', 'tomatoes'}), confidence=0.2072072072072072,
lift=3.0297490472929067), OrderedStatistic(items_base=frozenset({'ground beef',
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confidence=0.2072072072072072, lift=3.0297490472929067)])
RelationRecord(items=frozenset({'milk', 'herb & pepper', 'ground beef', '0'}),
support=0.0035995200639914677,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'milk', 'herb & pepper', '0'}),

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confidence=0.036635006784260515, lift=3.982596896938234),
OrderedStatistic(items_base=frozenset({'herb & pepper'}),
items_add=frozenset({'milk', 'ground beef', '0'}),
confidence=0.07277628032345013, lift=3.3084538103406027),
OrderedStatistic(items_base=frozenset({'ground beef', '0'}),
items_add=frozenset({'milk', 'herb & pepper'}), confidence=0.036635006784260515,
lift=3.982596896938234), OrderedStatistic(items_base=frozenset({'herb & pepper',
'0'}), items_add=frozenset({'milk', 'ground beef'}),
confidence=0.07277628032345013, lift=3.3084538103406027),
OrderedStatistic(items_base=frozenset({'milk', 'ground beef'}),
items_add=frozenset({'herb & pepper', '0'}), confidence=0.16363636363636364,
lift=3.3084538103406027), OrderedStatistic(items_base=frozenset({'milk', 'herb &
pepper'}), items_add=frozenset({'ground beef', '0'}),
confidence=0.3913043478260869, lift=3.9825968969382335),
OrderedStatistic(items_base=frozenset({'milk', 'ground beef', '0'}),
items_add=frozenset({'herb & pepper'}), confidence=0.16363636363636364,
lift=3.3084538103406027), OrderedStatistic(items_base=frozenset({'milk', 'herb &
pepper', '0'}), items_add=frozenset({'ground beef'}),
confidence=0.3913043478260869, lift=3.9825968969382335)])
RelationRecord(items=frozenset({'herb & pepper', 'ground beef', '0', 'mineral
water'}), support=0.006665777896280496,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'herb & pepper', '0', 'mineral water'}),
confidence=0.067842605156038, lift=3.9756826662143836),
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items_add=frozenset({'ground beef', '0', 'mineral water'}),
confidence=0.1347708894878706, lift=3.292887433382793),
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items_add=frozenset({'herb & pepper', 'mineral water'}),
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items_add=frozenset({'ground beef', 'mineral water'}),
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OrderedStatistic(items_base=frozenset({'ground beef', 'mineral water'}),
items_add=frozenset({'herb & pepper', '0'}), confidence=0.16286644951140067,
lift=3.2928874333827935), OrderedStatistic(items_base=frozenset({'herb &
pepper', 'mineral water'}), items_add=frozenset({'ground beef', '0'}),
confidence=0.39062500000000006, lift=3.975682666214383),
OrderedStatistic(items_base=frozenset({'ground beef', '0', 'mineral water'}),
items_add=frozenset({'herb & pepper'}), confidence=0.16286644951140067,
lift=3.2928874333827935), OrderedStatistic(items_base=frozenset({'herb &
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confidence=0.39062500000000006, lift=3.975682666214383)])
RelationRecord(items=frozenset({'herb & pepper', 'ground beef', '0',
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'herb & pepper', '0', 'spaghetti'}),
confidence=0.06512890094979648, lift=4.004359721511667),

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OrderedStatistic(items_base=frozenset({'herb & pepper'}),
items_add=frozenset({'ground beef', '0', 'spaghetti'}),
confidence=0.1293800539083558, lift=3.3009516475053635),
OrderedStatistic(items_base=frozenset({'ground beef', '0'}),
items_add=frozenset({'herb & pepper', 'spaghetti'}),
confidence=0.06512890094979648, lift=4.004359721511667),
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items_add=frozenset({'ground beef', 'spaghetti'}),
confidence=0.1293800539083558, lift=3.3009516475053635),
OrderedStatistic(items_base=frozenset({'ground beef', 'spaghetti'}),
items_add=frozenset({'herb & pepper', '0'}), confidence=0.163265306122449,
lift=3.3009516475053635), OrderedStatistic(items_base=frozenset({'herb &
pepper', 'spaghetti'}), items_add=frozenset({'ground beef', '0'}),
confidence=0.3934426229508197, lift=4.004359721511667),
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items_add=frozenset({'herb & pepper'}), confidence=0.163265306122449,
lift=3.3009516475053635), OrderedStatistic(items_base=frozenset({'herb &
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confidence=0.3934426229508197, lift=4.004359721511667)])
RelationRecord(items=frozenset({'milk', 'olive oil', 'ground beef', '0'}),
support=0.004932675643247567,
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items_add=frozenset({'milk', 'ground beef', '0'}),
confidence=0.07489878542510121, lift=3.4049441786283894),
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items_add=frozenset({'milk', 'ground beef'}), confidence=0.07505070993914807,
lift=3.4118507591124225), OrderedStatistic(items_base=frozenset({'milk', 'ground
beef'}), items_add=frozenset({'olive oil', '0'}),
confidence=0.22424242424242427, lift=3.4118507591124225),
OrderedStatistic(items_base=frozenset({'milk', 'ground beef', '0'}),
items_add=frozenset({'olive oil'}), confidence=0.22424242424242427,
lift=3.40494417862839)])
RelationRecord(items=frozenset({'milk', 'soup', 'ground beef', '0'}),
support=0.003999466737768298,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk'}),
items_add=frozenset({'ground beef', 'soup', '0'}),
confidence=0.030864197530864203, lift=3.1714019956029094),
OrderedStatistic(items_base=frozenset({'soup'}), items_add=frozenset({'milk',
'ground beef', '0'}), confidence=0.079155672823219, lift=3.5984648596785807),
OrderedStatistic(items_base=frozenset({'milk', '0'}),
items_add=frozenset({'ground beef', 'soup'}), confidence=0.030864197530864203,
lift=3.1714019956029094), OrderedStatistic(items_base=frozenset({'soup', '0'}),
items_add=frozenset({'milk', 'ground beef'}), confidence=0.079155672823219,
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lift=3.5984648596785807), OrderedStatistic(items_base=frozenset({'soup', 'ground
beef'}), items_add=frozenset({'milk', '0'}), confidence=0.4109589041095891,
lift=3.1714019956029094), OrderedStatistic(items_base=frozenset({'milk', 'ground

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beef', '0'})), items_add=frozenset({'soup'}), confidence=0.18181818181818185,
lift=3.5984648596785807), OrderedStatistic(items_base=frozenset({'soup', 'ground
beef', '0'})), items_add=frozenset({'milk'}), confidence=0.4109589041095891,
lift=3.1714019956029094)])
RelationRecord(items=frozenset({'pepper', 'ground beef', '0', 'spaghetti'}),
support=0.003332888948140248,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'pepper', '0', 'spaghetti'}), confidence=0.033921302578019,
lift=3.438428251861088), OrderedStatistic(items_base=frozenset({'pepper'}),
items_add=frozenset({'ground beef', '0', 'spaghetti'}),
confidence=0.12562814070351758, lift=3.2052268143438276),
OrderedStatistic(items_base=frozenset({'ground beef', '0'}),
items_add=frozenset({'pepper', 'spaghetti'}), confidence=0.033921302578019,
lift=3.438428251861088), OrderedStatistic(items_base=frozenset({'pepper', '0'}),
items_add=frozenset({'ground beef', 'spaghetti'}),
confidence=0.12562814070351758, lift=3.2052268143438276),
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items_add=frozenset({'pepper', '0'}), confidence=0.08503401360544217,
lift=3.2052268143438276), OrderedStatistic(items_base=frozenset({'pepper',
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confidence=0.33783783783783783, lift=3.4384282518610876),
OrderedStatistic(items_base=frozenset({'ground beef', '0', 'spaghetti'}),
items_add=frozenset({'pepper'}), confidence=0.08503401360544217,
lift=3.2052268143438276), OrderedStatistic(items_base=frozenset({'pepper', '0',
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confidence=0.33783783783783783, lift=3.4384282518610876)])
RelationRecord(items=frozenset({'shrimp', 'ground beef', '0', 'spaghetti'}),
support=0.005999200106652446,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'spaghetti'}),
items_add=frozenset({'shrimp', 'ground beef', '0'}),
confidence=0.03445635528330781, lift=3.0053153602336264),
OrderedStatistic(items_base=frozenset({'0', 'spaghetti'}),
items_add=frozenset({'shrimp', 'ground beef'}), confidence=0.03445635528330781,
lift=3.0053153602336264), OrderedStatistic(items_base=frozenset({'shrimp',
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confidence=0.5232558139534884, lift=3.005315360233627),
OrderedStatistic(items_base=frozenset({'shrimp', 'ground beef', '0'}),
items_add=frozenset({'spaghetti'}), confidence=0.5232558139534884,
lift=3.005315360233627)])
RelationRecord(items=frozenset({'tomato sauce', 'ground beef', '0',
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'tomato sauce', '0', 'spaghetti'}),
confidence=0.03120759837177748, lift=4.980599901844742),
OrderedStatistic(items_base=frozenset({'spaghetti'}),
items_add=frozenset({'ground beef', 'tomato sauce', '0'}),
confidence=0.01761102603369066, lift=3.302507656967841),
OrderedStatistic(items_base=frozenset({'tomato sauce'}),

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items_add=frozenset({'ground beef', '0', 'spaghetti'}),
confidence=0.2169811320754717, lift=5.535970992170453),
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items_add=frozenset({'tomato sauce', 'spaghetti'}),
confidence=0.03120759837177748, lift=4.980599901844742),
OrderedStatistic(items_base=frozenset({'0', 'spaghetti'}),
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confidence=0.01761102603369066, lift=3.302507656967841),
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items_add=frozenset({'ground beef', 'spaghetti'}),
confidence=0.2169811320754717, lift=5.535970992170453),
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items_add=frozenset({'tomato sauce', '0'}), confidence=0.0782312925170068,
lift=5.535970992170453), OrderedStatistic(items_base=frozenset({'tomato sauce',
'ground beef'}), items_add=frozenset({'0', 'spaghetti'}),
confidence=0.5750000000000001, lift=3.3025076569678413),
OrderedStatistic(items_base=frozenset({'tomato sauce', 'spaghetti'}),
items_add=frozenset({'ground beef', '0'}), confidence=0.4893617021276596,
lift=4.980599901844742), OrderedStatistic(items_base=frozenset({'ground beef',
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confidence=0.0782312925170068, lift=5.535970992170453),
OrderedStatistic(items_base=frozenset({'tomato sauce', 'ground beef', '0'}),
items_add=frozenset({'spaghetti'}), confidence=0.5750000000000001,
lift=3.3025076569678413), OrderedStatistic(items_base=frozenset({'tomato sauce',
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confidence=0.4893617021276596, lift=4.980599901844742)])
RelationRecord(items=frozenset({'spaghetti', 'light cream', '0', 'mineral
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'light cream'}),
items_add=frozenset({'0', 'spaghetti', 'mineral water'}),
confidence=0.20512820512820515, lift=3.4345238095238098),
OrderedStatistic(items_base=frozenset({'light cream', '0'}),
items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.20512820512820515, lift=3.4345238095238098),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'light cream', '0'}), confidence=0.053571428571428575,
lift=3.4345238095238098), OrderedStatistic(items_base=frozenset({'spaghetti',
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confidence=0.053571428571428575, lift=3.4345238095238098)])
RelationRecord(items=frozenset({'milk', 'soup', '0', 'mineral water'}),
support=0.008532195707239034,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'soup'}),
items_add=frozenset({'milk', '0', 'mineral water'}),
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items_add=frozenset({'milk', 'mineral water'}), confidence=0.16886543535620052,
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lift=3.5184989739079446), OrderedStatistic(items_base=frozenset({'milk', '0',
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confidence=0.02469135802469136, lift=3.0868312757201646),
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items_add=frozenset({'shrimp', 'olive oil'}), confidence=0.02469135802469136,
lift=3.0362274843149164), OrderedStatistic(items_base=frozenset({'shrimp',
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confidence=0.3934426229508197, lift=3.0362274843149164),
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items_add=frozenset({'milk'}), confidence=0.39999999999999997,
lift=3.0868312757201646)])
RelationRecord(items=frozenset({'milk', 'soup', 'olive oil', '0'}),
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items_add=frozenset({'milk', '0'}), confidence=0.4029850746268656,
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lift=3.0825089038385434), OrderedStatistic(items_base=frozenset({'olive oil',
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OrderedStatistic(items_base=frozenset({'milk', 'spaghetti'}),
items_add=frozenset({'olive oil', '0'}), confidence=0.20300751879699247,
lift=3.088761457396025), OrderedStatistic(items_base=frozenset({'milk', '0',
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confidence=0.20300751879699247, lift=3.0825089038385434)])
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lift=3.4133230452674903), OrderedStatistic(items_base=frozenset({'soup'}),
items_add=frozenset({'milk', '0', 'tomatoes'}), confidence=0.06068601583113457,
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items_add=frozenset({'milk', '0'}), confidence=0.4545454545454546,
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confidence=0.11278195488721805, lift=3.827952233524989),
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confidence=0.07894736842105264, lift=3.423030118649225),
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lift=3.7469452058303663), OrderedStatistic(items_base=frozenset({'olive oil',
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lift=3.746945205830366), OrderedStatistic(items_base=frozenset({'soup', '0',
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confidence=0.22543352601156072, lift=3.4230301186492245)])
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confidence=0.4027777777777778, lift=6.128267973856209),
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lift=4.77812678469446), OrderedStatistic(items_base=frozenset({'whole wheat
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items_add=frozenset({'0', 'tomatoes', 'mineral water'}),
confidence=0.07387862796833773, lift=3.0282163300027394),
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items_add=frozenset({'tomatoes', 'mineral water'}),
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items_add=frozenset({'soup', '0'}), confidence=0.15300546448087432,
lift=3.0282163300027394), OrderedStatistic(items_base=frozenset({'tomatoes',
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items_add=frozenset({'0', 'pancakes', 'spaghetti'}),
confidence=0.07692307692307693, lift=3.052910052910053),
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lift=3.0591025682303568), OrderedStatistic(items_base=frozenset({'pancakes',
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confidence=0.20105820105820105, lift=3.0591025682303568),
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lift=3.5099115194827295), OrderedStatistic(items_base=frozenset({'olive oil',
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confidence=0.6111111111111112, lift=3.5099115194827295),
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items_add=frozenset({'eggs', 'ground beef'}), confidence=0.0782312925170068,
lift=3.912086167800454), OrderedStatistic(items_base=frozenset({'eggs', 'ground
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confidence=0.15333333333333335, lift=3.912086167800454),
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confidence=0.08394160583941607, lift=3.6395721699506356)])
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confidence=0.13294797687861273, lift=4.771496529026192),
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confidence=0.0782312925170068, lift=3.4117030533143495),
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OrderedStatistic(items_base=frozenset({'chocolate', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'milk'}),
confidence=0.0759493670886076, lift=3.218622613173139),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk'}),
items_add=frozenset({'chocolate', 'mineral water'}),
confidence=0.16949152542372883, lift=3.2186226131731392),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'mineral water'}),
items_add=frozenset({'milk', 'chocolate'}), confidence=0.11194029850746269,
lift=3.484083730723974), OrderedStatistic(items_base=frozenset({'milk', 'mineral
water'}), items_add=frozenset({'frozen vegetables', 'chocolate'}),
confidence=0.08333333333333334, lift=3.6342054263565897),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'chocolate',
'mineral water'}), items_add=frozenset({'milk'}), confidence=0.4109589041095891,
lift=3.1714019956029094)])
RelationRecord(items=frozenset({'frozen vegetables', 'milk', 'chocolate',
'spaghetti'}), support=0.0034662045060658577,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen

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vegetables'}), items_add=frozenset({'milk', 'chocolate', 'spaghetti'}),
confidence=0.03636363636363636, lift=3.326385809312639),
OrderedStatistic(items_base=frozenset({'milk'}), items_add=frozenset({'frozen
vegetables', 'chocolate', 'spaghetti'}), confidence=0.026748971193415638,
lift=3.400746320708656), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'chocolate'}), items_add=frozenset({'milk', 'spaghetti'}),
confidence=0.1511627906976744, lift=4.262677041440811),
OrderedStatistic(items_base=frozenset({'milk', 'chocolate'}),
items_add=frozenset({'frozen vegetables', 'spaghetti'}),
confidence=0.1078838174273859, lift=3.87194504556374),
OrderedStatistic(items_base=frozenset({'chocolate', 'spaghetti'}),
items_add=frozenset({'frozen vegetables', 'milk'}),
confidence=0.08843537414965985, lift=3.747761251393212),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk'}),
items_add=frozenset({'chocolate', 'spaghetti'}), confidence=0.14689265536723162,
lift=3.747761251393212), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'spaghetti'}), items_add=frozenset({'milk', 'chocolate'}),
confidence=0.12440191387559808, lift=3.87194504556374),
OrderedStatistic(items_base=frozenset({'milk', 'spaghetti'}),
items_add=frozenset({'frozen vegetables', 'chocolate'}),
confidence=0.09774436090225563, lift=4.262677041440812),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'chocolate',
'spaghetti'}), items_add=frozenset({'milk'}), confidence=0.44067796610169485,
lift=3.4007463207086555), OrderedStatistic(items_base=frozenset({'milk',
'chocolate', 'spaghetti'}), items_add=frozenset({'frozen vegetables'}),
confidence=0.3170731707317073, lift=3.3263858093126384)])
RelationRecord(items=frozenset({'frozen vegetables', 'chocolate', 'shrimp',
'mineral water'}), support=0.003199573390214638,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'chocolate', 'shrimp', 'mineral water'}),
confidence=0.033566433566433566, lift=4.417224880382775),
OrderedStatistic(items_base=frozenset({'shrimp'}), items_add=frozenset({'frozen
vegetables', 'chocolate', 'mineral water'}), confidence=0.04477611940298507,
lift=4.600899611531384), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'chocolate'}), items_add=frozenset({'shrimp', 'mineral water'}),
confidence=0.13953488372093026, lift=5.913283405597163),
OrderedStatistic(items_base=frozenset({'chocolate', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'shrimp'}),
confidence=0.06075949367088608, lift=3.6460556962025317),
OrderedStatistic(items_base=frozenset({'chocolate', 'shrimp'}),
items_add=frozenset({'frozen vegetables', 'mineral water'}),
confidence=0.1777777777777778, lift=4.975787728026535),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'mineral water'}),
items_add=frozenset({'chocolate', 'shrimp'}), confidence=0.08955223880597014,
lift=4.975787728026535), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'shrimp'}), items_add=frozenset({'chocolate', 'mineral water'}),
confidence=0.192, lift=3.6460556962025317),
OrderedStatistic(items_base=frozenset({'shrimp', 'mineral water'}),

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items_add=frozenset({'frozen vegetables', 'chocolate'}),
confidence=0.13559322033898305, lift=5.913283405597162),
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confidence=0.32876712328767127, lift=4.600899611531385),
OrderedStatistic(items_base=frozenset({'chocolate', 'shrimp', 'mineral water'}),
items_add=frozenset({'frozen vegetables'}), confidence=0.4210526315789474,
lift=4.417224880382776)])
RelationRecord(items=frozenset({'frozen vegetables', 'chocolate', 'spaghetti',
'mineral water'}), support=0.0041327822956939075,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen vegetables',
'chocolate'}), items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.1802325581395349, lift=3.0176884343853825),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'chocolate'}),
confidence=0.06919642857142858, lift=3.0176884343853825)])
RelationRecord(items=frozenset({'milk', 'chocolate', 'ground beef', 'mineral
water'}), support=0.003332888948140248,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'chocolate', 'ground
beef'}), items_add=frozenset({'milk', 'mineral water'}),
confidence=0.14450867052023122, lift=3.0109987154784847),
OrderedStatistic(items_base=frozenset({'milk', 'mineral water'}),
items_add=frozenset({'chocolate', 'ground beef'}),
confidence=0.06944444444444445, lift=3.0109987154784843)])
RelationRecord(items=frozenset({'chocolate', 'olive oil', 'spaghetti', 'mineral
water'}), support=0.0038661511798426876,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'chocolate', 'spaghetti', 'mineral water'}),
confidence=0.058704453441295545, lift=3.700353825740822),
OrderedStatistic(items_base=frozenset({'chocolate', 'mineral water'}),
items_add=frozenset({'olive oil', 'spaghetti'}), confidence=0.07341772151898734,
lift=3.201780983220489), OrderedStatistic(items_base=frozenset({'chocolate',
'olive oil'}), items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.23577235772357724, lift=3.947608159117306),
OrderedStatistic(items_base=frozenset({'chocolate', 'spaghetti'}),
items_add=frozenset({'olive oil', 'mineral water'}),
confidence=0.09863945578231292, lift=3.5743698445561796),
OrderedStatistic(items_base=frozenset({'olive oil', 'mineral water'}),
items_add=frozenset({'chocolate', 'spaghetti'}), confidence=0.1400966183574879,
lift=3.5743698445561796), OrderedStatistic(items_base=frozenset({'spaghetti',
'mineral water'}), items_add=frozenset({'chocolate', 'olive oil'}),
confidence=0.06473214285714286, lift=3.947608159117306),
OrderedStatistic(items_base=frozenset({'olive oil', 'spaghetti'}),
items_add=frozenset({'chocolate', 'mineral water'}),
confidence=0.1686046511627907, lift=3.2017809832204884),
OrderedStatistic(items_base=frozenset({'chocolate', 'spaghetti', 'mineral
water'}), items_add=frozenset({'olive oil'}), confidence=0.2436974789915966,
lift=3.700353825740822)])

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RelationRecord(items=frozenset({'spaghetti', 'chocolate', 'pancakes', 'mineral
water'}), support=0.0037328356219170776,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'chocolate',
'pancakes'}), items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.1879194630872483, lift=3.1463926174496644),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'chocolate', 'pancakes'}), confidence=0.0625,
lift=3.1463926174496644)])
RelationRecord(items=frozenset({'chocolate', 'shrimp', 'spaghetti', 'mineral
water'}), support=0.0034662045060658577,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'shrimp'}),
items_add=frozenset({'chocolate', 'spaghetti', 'mineral water'}),
confidence=0.04850746268656716, lift=3.0576006522011783),
OrderedStatistic(items_base=frozenset({'chocolate', 'mineral water'}),
items_add=frozenset({'shrimp', 'spaghetti'}), confidence=0.06582278481012657,
lift=3.10526231987899), OrderedStatistic(items_base=frozenset({'chocolate',
'shrimp'}), items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.1925925925925926, lift=3.2246362433862434),
OrderedStatistic(items_base=frozenset({'chocolate', 'spaghetti'}),
items_add=frozenset({'shrimp', 'mineral water'}),
confidence=0.08843537414965985, lift=3.747761251393212),
OrderedStatistic(items_base=frozenset({'shrimp', 'mineral water'}),
items_add=frozenset({'chocolate', 'spaghetti'}), confidence=0.14689265536723162,
lift=3.747761251393212), OrderedStatistic(items_base=frozenset({'spaghetti',
'mineral water'}), items_add=frozenset({'chocolate', 'shrimp'}),
confidence=0.05803571428571428, lift=3.2246362433862434),
OrderedStatistic(items_base=frozenset({'shrimp', 'spaghetti'}),
items_add=frozenset({'chocolate', 'mineral water'}),
confidence=0.16352201257861634, lift=3.10526231987899),
OrderedStatistic(items_base=frozenset({'chocolate', 'spaghetti', 'mineral
water'}), items_add=frozenset({'shrimp'}), confidence=0.21848739495798317,
lift=3.0576006522011783)])
RelationRecord(items=frozenset({'frozen vegetables', 'eggs', 'milk', 'mineral
water'}), support=0.0037328356219170776,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk'}),
items_add=frozenset({'frozen vegetables', 'eggs', 'mineral water'}),
confidence=0.02880658436213992, lift=3.177620430888405),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'eggs'}),
items_add=frozenset({'milk', 'mineral water'}), confidence=0.17177914110429446,
lift=3.5792092706203134), OrderedStatistic(items_base=frozenset({'eggs',
'milk'}), items_add=frozenset({'frozen vegetables', 'mineral water'}),
confidence=0.12121212121212122, lift=3.392582541836273),
OrderedStatistic(items_base=frozenset({'eggs', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'milk'}),
confidence=0.07329842931937172, lift=3.106279764545804),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk'}),
items_add=frozenset({'eggs', 'mineral water'}), confidence=0.1581920903954802,
lift=3.106279764545804), OrderedStatistic(items_base=frozenset({'frozen

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vegetables', 'mineral water'})), items_add=frozenset({'eggs', 'milk'}),
confidence=0.10447761194029849, lift=3.3925825418362727),
OrderedStatistic(items_base=frozenset({'milk', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'eggs'}),
confidence=0.07777777777777778, lift=3.5792092706203134),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'eggs', 'mineral
water'}), items_add=frozenset({'milk'}), confidence=0.411764705882353,
lift=3.177620430888405)])
RelationRecord(items=frozenset({'eggs', 'ground beef', 'milk', 'mineral
water'}), support=0.003332888948140248,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'eggs', 'ground
beef'}), items_add=frozenset({'milk', 'mineral water'}),
confidence=0.16666666666666669, lift=3.4726851851851857),
OrderedStatistic(items_base=frozenset({'milk', 'mineral water'}),
items_add=frozenset({'eggs', 'ground beef'}), confidence=0.06944444444444445,
lift=3.4726851851851857)])
RelationRecord(items=frozenset({'eggs', 'ground beef', 'spaghetti', 'mineral
water'}), support=0.0038661511798426876,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'eggs', 'ground
beef'}), items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.19333333333333336, lift=3.237038690476191),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'eggs', 'ground beef'}), confidence=0.06473214285714286,
lift=3.237038690476191)])
RelationRecord(items=frozenset({'milk', 'frozen smoothie', 'spaghetti', 'mineral
water'}), support=0.003199573390214638,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen smoothie'}),
items_add=frozenset({'milk', 'spaghetti', 'mineral water'}),
confidence=0.05052631578947369, lift=3.2118465655664585),
OrderedStatistic(items_base=frozenset({'milk'}), items_add=frozenset({'frozen
smoothie', 'spaghetti', 'mineral water'}), confidence=0.02469135802469136,
lift=3.6315662067296057), OrderedStatistic(items_base=frozenset({'milk', 'frozen
smoothie'}), items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.22429906542056074, lift=3.7555073431241657),
OrderedStatistic(items_base=frozenset({'frozen smoothie', 'mineral water'}),
items_add=frozenset({'milk', 'spaghetti'}), confidence=0.15789473684210528,
lift=4.452512861100119), OrderedStatistic(items_base=frozenset({'frozen
smoothie', 'spaghetti'}), items_add=frozenset({'milk', 'mineral water'}),
confidence=0.20512820512820515, lift=4.274074074074075),
OrderedStatistic(items_base=frozenset({'milk', 'mineral water'}),
items_add=frozenset({'frozen smoothie', 'spaghetti'}),
confidence=0.06666666666666668, lift=4.274074074074075),
OrderedStatistic(items_base=frozenset({'milk', 'spaghetti'}),
items_add=frozenset({'frozen smoothie', 'mineral water'}),
confidence=0.09022556390977443, lift=4.452512861100119),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'milk', 'frozen smoothie'}),
confidence=0.053571428571428575, lift=3.7555073431241657),

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OrderedStatistic(items_base=frozenset({'frozen smoothie', 'spaghetti', 'mineral
water'}), items_add=frozenset({'milk'}), confidence=0.4705882352941177,
lift=3.631566206729606), OrderedStatistic(items_base=frozenset({'milk',
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confidence=0.2033898305084746, lift=3.211846565566459)])
RelationRecord(items=frozenset({'frozen vegetables', 'milk', 'ground beef',
'mineral water'}), support=0.0037328356219170776,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'milk', 'ground beef', 'mineral water'}),
confidence=0.03916083916083916, lift=3.5391018619934282),
OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'frozen vegetables', 'milk', 'mineral water'}),
confidence=0.037991858887381276, lift=3.433457030292132),
OrderedStatistic(items_base=frozenset({'milk'}), items_add=frozenset({'frozen
vegetables', 'ground beef', 'mineral water'}), confidence=0.02880658436213992,
lift=3.1315679608755294), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'ground beef'}), items_add=frozenset({'milk', 'mineral water'}),
confidence=0.22047244094488186, lift=4.593788276465442),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk'}),
items_add=frozenset({'ground beef', 'mineral water'}),
confidence=0.1581920903954802, lift=3.865142899206831),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'mineral water'}),
items_add=frozenset({'milk', 'ground beef'}), confidence=0.10447761194029849,
lift=4.749615558570782), OrderedStatistic(items_base=frozenset({'milk', 'ground
beef'}), items_add=frozenset({'frozen vegetables', 'mineral water'}),
confidence=0.1696969696969697, lift=4.749615558570782),
OrderedStatistic(items_base=frozenset({'ground beef', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'milk'}),
confidence=0.09120521172638436, lift=3.865142899206831),
OrderedStatistic(items_base=frozenset({'milk', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'ground beef'}),
confidence=0.07777777777777778, lift=4.593788276465442),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'ground beef',
'mineral water'}), items_add=frozenset({'milk'}),
confidence=0.40579710144927533, lift=3.1315679608755294),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk', 'mineral
water'}), items_add=frozenset({'ground beef'}), confidence=0.3373493975903614,
lift=3.4334570302921317), OrderedStatistic(items_base=frozenset({'milk', 'ground
beef', 'mineral water'}), items_add=frozenset({'frozen vegetables'}),
confidence=0.3373493975903614, lift=3.539101861993428)])
RelationRecord(items=frozenset({'frozen vegetables', 'milk', 'ground beef',
'spaghetti'}), support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'milk', 'ground beef', 'spaghetti'}),
confidence=0.03216783216783217, lift=3.3053549190535496),
OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'frozen vegetables', 'milk', 'spaghetti'}),
confidence=0.03120759837177748, lift=3.77561605462424),

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OrderedStatistic(items_base=frozenset({'spaghetti'}),
items_add=frozenset({'frozen vegetables', 'milk', 'ground beef'}),
confidence=0.01761102603369066, lift=3.0721001460165964),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'ground beef'}),
items_add=frozenset({'milk', 'spaghetti'}), confidence=0.1811023622047244,
lift=5.1069504469836), OrderedStatistic(items_base=frozenset({'frozen
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confidence=0.12994350282485875, lift=3.315327260847842),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'spaghetti'}),
items_add=frozenset({'milk', 'ground beef'}), confidence=0.11004784688995216,
lift=5.002841815282007), OrderedStatistic(items_base=frozenset({'milk', 'ground
beef'}), items_add=frozenset({'frozen vegetables', 'spaghetti'}),
confidence=0.1393939393939394, lift=5.002841815282007),
OrderedStatistic(items_base=frozenset({'ground beef', 'spaghetti'}),
items_add=frozenset({'frozen vegetables', 'milk'}),
confidence=0.0782312925170068, lift=3.315327260847842),
OrderedStatistic(items_base=frozenset({'milk', 'spaghetti'}),
items_add=frozenset({'frozen vegetables', 'ground beef'}),
confidence=0.08646616541353383, lift=5.1069504469836),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk', 'ground
beef'}), items_add=frozenset({'spaghetti'}), confidence=0.5348837209302326,
lift=3.0721001460165964), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'milk', 'spaghetti'}), items_add=frozenset({'ground beef'}),
confidence=0.3709677419354839, lift=3.7756160546242397),
OrderedStatistic(items_base=frozenset({'milk', 'ground beef', 'spaghetti'}),
items_add=frozenset({'frozen vegetables'}), confidence=0.3150684931506849,
lift=3.305354919053549)])
RelationRecord(items=frozenset({'frozen vegetables', 'ground beef', 'spaghetti',
'mineral water'}), support=0.004399413411545127,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'frozen vegetables', 'spaghetti', 'mineral water'}),
confidence=0.04477611940298508, lift=3.731840796019901),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'ground beef'}),
items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.25984251968503935, lift=4.350622187851519),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'mineral water'}),
items_add=frozenset({'ground beef', 'spaghetti'}),
confidence=0.12313432835820895, lift=3.1416006701187937),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'spaghetti'}),
items_add=frozenset({'ground beef', 'mineral water'}),
confidence=0.15789473684210528, lift=3.857877593005315),
OrderedStatistic(items_base=frozenset({'ground beef', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'spaghetti'}),
confidence=0.10749185667752444, lift=3.857877593005315),
OrderedStatistic(items_base=frozenset({'ground beef', 'spaghetti'}),
items_add=frozenset({'frozen vegetables', 'mineral water'}),
confidence=0.11224489795918367, lift=3.1416006701187937),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),

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items_add=frozenset({'frozen vegetables', 'ground beef'}),
confidence=0.07366071428571429, lift=4.350622187851518),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'spaghetti',
'mineral water'}), items_add=frozenset({'ground beef'}),
confidence=0.3666666666666667, lift=3.7318407960199007)])
RelationRecord(items=frozenset({'frozen vegetables', 'milk', 'olive oil',
'mineral water'}), support=0.003332888948140248,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'milk', 'olive oil', 'mineral water'}),
confidence=0.03496503496503497, lift=4.098011363636364),
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vegetables', 'olive oil', 'mineral water'}), confidence=0.025720164609053502,
lift=3.9372847904593944), OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'frozen vegetables', 'milk', 'mineral water'}),
confidence=0.05060728744939272, lift=4.573557387444516),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk'}),
items_add=frozenset({'olive oil', 'mineral water'}),
confidence=0.14124293785310735, lift=5.118180081334097),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'mineral water'}),
items_add=frozenset({'milk', 'olive oil'}), confidence=0.09328358208955223,
lift=5.4665636660447765), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'olive oil'}), items_add=frozenset({'milk', 'mineral water'}),
confidence=0.29411764705882354, lift=6.12826797385621),
OrderedStatistic(items_base=frozenset({'milk', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'olive oil'}),
confidence=0.06944444444444445, lift=6.128267973856209),
OrderedStatistic(items_base=frozenset({'milk', 'olive oil'}),
items_add=frozenset({'frozen vegetables', 'mineral water'}),
confidence=0.19531250000000003, lift=5.4665636660447765),
OrderedStatistic(items_base=frozenset({'olive oil', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'milk'}),
confidence=0.12077294685990338, lift=5.118180081334097),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk', 'mineral
water'}), items_add=frozenset({'olive oil'}), confidence=0.30120481927710846,
lift=4.573557387444516), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'olive oil', 'mineral water'}), items_add=frozenset({'milk'}),
confidence=0.5102040816326531, lift=3.937284790459394),
OrderedStatistic(items_base=frozenset({'milk', 'olive oil', 'mineral water'}),
items_add=frozenset({'frozen vegetables'}), confidence=0.39062500000000006,
lift=4.098011363636364)])
RelationRecord(items=frozenset({'frozen vegetables', 'milk', 'soup', 'mineral
water'}), support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'milk', 'soup', 'mineral water'}),
confidence=0.03216783216783217, lift=3.7701704545454553),
OrderedStatistic(items_base=frozenset({'milk'}), items_add=frozenset({'frozen
vegetables', 'soup', 'mineral water'}), confidence=0.02366255144032922,
lift=4.670863114576566), OrderedStatistic(items_base=frozenset({'mineral

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water'}), items_add=frozenset({'frozen vegetables', 'milk', 'soup'}),
confidence=0.012863534675615214, lift=3.2163124533929905),
OrderedStatistic(items_base=frozenset({'soup'}), items_add=frozenset({'frozen
vegetables', 'milk', 'mineral water'}), confidence=0.06068601583113457,
lift=5.484407286136632), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'milk'}), items_add=frozenset({'soup', 'mineral water'}),
confidence=0.12994350282485875, lift=5.634139969302113),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'mineral water'}),
items_add=frozenset({'milk', 'soup'}), confidence=0.08582089552238806,
lift=5.646864362398533), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'soup'}), items_add=frozenset({'milk', 'mineral water'}),
confidence=0.3833333333333333, lift=7.987175925925926),
OrderedStatistic(items_base=frozenset({'milk', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'soup'}),
confidence=0.06388888888888889, lift=7.987175925925926),
OrderedStatistic(items_base=frozenset({'milk', 'soup'}),
items_add=frozenset({'frozen vegetables', 'mineral water'}),
confidence=0.20175438596491227, lift=5.646864362398533),
OrderedStatistic(items_base=frozenset({'soup', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'milk'}),
confidence=0.13294797687861273, lift=5.6341399693021135),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk', 'mineral
water'}), items_add=frozenset({'soup'}), confidence=0.27710843373493976,
lift=5.484407286136631), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'milk', 'soup'}), items_add=frozenset({'mineral water'}),
confidence=0.7666666666666666, lift=3.21631245339299),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'soup', 'mineral
water'}), items_add=frozenset({'milk'}), confidence=0.6052631578947368,
lift=4.670863114576565), OrderedStatistic(items_base=frozenset({'milk', 'soup',
'mineral water'}), items_add=frozenset({'frozen vegetables'}),
confidence=0.35937500000000006, lift=3.7701704545454553)])
RelationRecord(items=frozenset({'frozen vegetables', 'milk', 'spaghetti',
'mineral water'}), support=0.004532728969470737,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'milk', 'spaghetti', 'mineral water'}),
confidence=0.04755244755244755, lift=3.0228043143297376),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk'}),
items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.19209039548022597, lift=3.216227804681194),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'mineral water'}),
items_add=frozenset({'milk', 'spaghetti'}), confidence=0.12686567164179102,
lift=3.5775165525754677), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'spaghetti'}), items_add=frozenset({'milk', 'mineral water'}),
confidence=0.16267942583732056, lift=3.389606592238171),
OrderedStatistic(items_base=frozenset({'milk', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'spaghetti'}),
confidence=0.09444444444444444, lift=3.389606592238171),
OrderedStatistic(items_base=frozenset({'milk', 'spaghetti'}),

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items_add=frozenset({'frozen vegetables', 'mineral water'}),
confidence=0.12781954887218044, lift=3.577516552575468),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'milk'}),
confidence=0.07589285714285714, lift=3.216227804681194),
OrderedStatistic(items_base=frozenset({'milk', 'spaghetti', 'mineral water'}),
items_add=frozenset({'frozen vegetables'}), confidence=0.28813559322033894,
lift=3.0228043143297376)])
RelationRecord(items=frozenset({'frozen vegetables', 'shrimp', 'spaghetti',
'mineral water'}), support=0.003332888948140248,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'shrimp', 'spaghetti', 'mineral water'}),
confidence=0.03496503496503497, lift=4.098011363636364),
OrderedStatistic(items_base=frozenset({'shrimp'}), items_add=frozenset({'frozen
vegetables', 'spaghetti', 'mineral water'}), confidence=0.046641791044776115,
lift=3.8873341625207294), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'mineral water'}), items_add=frozenset({'shrimp', 'spaghetti'}),
confidence=0.09328358208955223, lift=4.400755655683844),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'shrimp'}),
items_add=frozenset({'spaghetti', 'mineral water'}), confidence=0.2,
lift=3.3486607142857148), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'spaghetti'}), items_add=frozenset({'shrimp', 'mineral water'}),
confidence=0.11961722488038279, lift=5.069202281512719),
OrderedStatistic(items_base=frozenset({'shrimp', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'spaghetti'}),
confidence=0.14124293785310735, lift=5.069202281512719),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'shrimp'}),
confidence=0.05580357142857143, lift=3.3486607142857143),
OrderedStatistic(items_base=frozenset({'shrimp', 'spaghetti'}),
items_add=frozenset({'frozen vegetables', 'mineral water'}),
confidence=0.15723270440251574, lift=4.400755655683845),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'spaghetti',
'mineral water'}), items_add=frozenset({'shrimp'}),
confidence=0.2777777777777778, lift=3.8873341625207294),
OrderedStatistic(items_base=frozenset({'shrimp', 'spaghetti', 'mineral water'}),
items_add=frozenset({'frozen vegetables'}), confidence=0.39062500000000006,
lift=4.098011363636364)])
RelationRecord(items=frozenset({'frozen vegetables', 'tomatoes', 'spaghetti',
'mineral water'}), support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'mineral water', 'tomatoes', 'spaghetti'}),
confidence=0.03216783216783217, lift=3.4470129870129873),
OrderedStatistic(items_base=frozenset({'spaghetti'}),
items_add=frozenset({'frozen vegetables', 'tomatoes', 'mineral water'}),
confidence=0.01761102603369066, lift=3.0022796881525826),
OrderedStatistic(items_base=frozenset({'tomatoes'}),
items_add=frozenset({'frozen vegetables', 'spaghetti', 'mineral water'}),

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confidence=0.04483430799220273, lift=3.736690491661252),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'mineral water'}),
items_add=frozenset({'tomatoes', 'spaghetti'}), confidence=0.08582089552238806,
lift=4.1002709383021205), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'spaghetti'}), items_add=frozenset({'tomatoes', 'mineral water'}),
confidence=0.11004784688995216, lift=4.510759013778858),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'tomatoes'}),
items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.1900826446280992, lift=3.1826114226682414),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'tomatoes'}),
confidence=0.05133928571428572, lift=3.1826114226682414),
OrderedStatistic(items_base=frozenset({'tomatoes', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'spaghetti'}),
confidence=0.12568306010928962, lift=4.510759013778858),
OrderedStatistic(items_base=frozenset({'tomatoes', 'spaghetti'}),
items_add=frozenset({'frozen vegetables', 'mineral water'}),
confidence=0.14649681528662423, lift=4.1002709383021205),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'spaghetti',
'mineral water'}), items_add=frozenset({'tomatoes'}),
confidence=0.2555555555555556, lift=3.7366904916612524),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'tomatoes', 'mineral
water'}), items_add=frozenset({'spaghetti'}), confidence=0.5227272727272727,
lift=3.0022796881525826), OrderedStatistic(items_base=frozenset({'tomatoes',
'spaghetti', 'mineral water'}), items_add=frozenset({'frozen vegetables'}),
confidence=0.32857142857142857, lift=3.447012987012987)])
RelationRecord(items=frozenset({'milk', 'ground beef', 'spaghetti', 'mineral
water'}), support=0.004399413411545127,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk', 'ground
beef'}), items_add=frozenset({'spaghetti', 'mineral water'}), confidence=0.2,
lift=3.3486607142857148), OrderedStatistic(items_base=frozenset({'ground beef',
'mineral water'}), items_add=frozenset({'milk', 'spaghetti'}),
confidence=0.10749185667752444, lift=3.0311895373613185),
OrderedStatistic(items_base=frozenset({'milk', 'spaghetti'}),
items_add=frozenset({'ground beef', 'mineral water'}),
confidence=0.12406015037593984, lift=3.0311895373613185),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'milk', 'ground beef'}), confidence=0.07366071428571429,
lift=3.3486607142857148)])
RelationRecord(items=frozenset({'olive oil', 'ground beef', 'spaghetti',
'mineral water'}), support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'olive oil', 'spaghetti', 'mineral water'}),
confidence=0.03120759837177748, lift=3.040106433593544),
OrderedStatistic(items_base=frozenset({'ground beef', 'mineral water'}),
items_add=frozenset({'olive oil', 'spaghetti'}), confidence=0.0749185667752443,
lift=3.267233542913416), OrderedStatistic(items_base=frozenset({'olive oil',
'ground beef'}), items_add=frozenset({'spaghetti', 'mineral water'}),

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confidence=0.2169811320754717, lift=3.63298096361186),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'ground beef', 'olive oil'}),
confidence=0.05133928571428572, lift=3.63298096361186),
OrderedStatistic(items_base=frozenset({'olive oil', 'spaghetti'}),
items_add=frozenset({'ground beef', 'mineral water'}),
confidence=0.13372093023255816, lift=3.267233542913416),
OrderedStatistic(items_base=frozenset({'olive oil', 'spaghetti', 'mineral
water'}), items_add=frozenset({'ground beef'}), confidence=0.2987012987012987,
lift=3.0401064335935435)])
RelationRecord(items=frozenset({'spaghetti', 'ground beef', 'pancakes', 'mineral
water'}), support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef',
'pancakes'}), items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.21100917431192662, lift=3.532990661861075),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'ground beef', 'pancakes'}),
confidence=0.05133928571428572, lift=3.532990661861075)])
RelationRecord(items=frozenset({'ground beef', 'tomatoes', 'spaghetti', 'mineral
water'}), support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'mineral water', 'tomatoes', 'spaghetti'}),
confidence=0.03120759837177748, lift=3.344117076952898),
OrderedStatistic(items_base=frozenset({'spaghetti'}),
items_add=frozenset({'ground beef', 'tomatoes', 'mineral water'}),
confidence=0.01761102603369066, lift=3.221958689724723),
OrderedStatistic(items_base=frozenset({'ground beef', 'mineral water'}),
items_add=frozenset({'tomatoes', 'spaghetti'}), confidence=0.0749185667752443,
lift=3.579389613892405), OrderedStatistic(items_base=frozenset({'ground beef',
'spaghetti'}), items_add=frozenset({'tomatoes', 'mineral water'}),
confidence=0.0782312925170068, lift=3.2066280063938146),
OrderedStatistic(items_base=frozenset({'ground beef', 'tomatoes'}),
items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.26136363636363635, lift=4.3760907061688314),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'ground beef', 'tomatoes'}),
confidence=0.05133928571428572, lift=4.3760907061688314),
OrderedStatistic(items_base=frozenset({'tomatoes', 'mineral water'}),
items_add=frozenset({'ground beef', 'spaghetti'}),
confidence=0.12568306010928962, lift=3.206628006393814),
OrderedStatistic(items_base=frozenset({'tomatoes', 'spaghetti'}),
items_add=frozenset({'ground beef', 'mineral water'}),
confidence=0.14649681528662423, lift=3.579389613892405),
OrderedStatistic(items_base=frozenset({'ground beef', 'tomatoes', 'mineral
water'}), items_add=frozenset({'spaghetti'}), confidence=0.5609756097560976,
lift=3.221958689724723), OrderedStatistic(items_base=frozenset({'tomatoes',
'spaghetti', 'mineral water'}), items_add=frozenset({'ground beef'}),
confidence=0.32857142857142857, lift=3.344117076952898)])

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RelationRecord(items=frozenset({'milk', 'olive oil', 'spaghetti', 'mineral
water'}), support=0.003332888948140248,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'milk', 'spaghetti', 'mineral water'}),
confidence=0.05060728744939272, lift=3.216993755575379),
OrderedStatistic(items_base=frozenset({'milk', 'mineral water'}),
items_add=frozenset({'olive oil', 'spaghetti'}), confidence=0.06944444444444445,
lift=3.0285045219638245), OrderedStatistic(items_base=frozenset({'milk', 'olive
oil'}), items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.19531250000000003, lift=3.2701764787946432),
OrderedStatistic(items_base=frozenset({'milk', 'spaghetti'}),
items_add=frozenset({'olive oil', 'mineral water'}),
confidence=0.09398496240601503, lift=3.4057062947223127),
OrderedStatistic(items_base=frozenset({'olive oil', 'mineral water'}),
items_add=frozenset({'milk', 'spaghetti'}), confidence=0.12077294685990338,
lift=3.4057062947223127), OrderedStatistic(items_base=frozenset({'spaghetti',
'mineral water'}), items_add=frozenset({'milk', 'olive oil'}),
confidence=0.05580357142857143, lift=3.2701764787946432),
OrderedStatistic(items_base=frozenset({'olive oil', 'spaghetti'}),
items_add=frozenset({'milk', 'mineral water'}), confidence=0.14534883720930233,
lift=3.0285045219638245), OrderedStatistic(items_base=frozenset({'milk',
'spaghetti', 'mineral water'}), items_add=frozenset({'olive oil'}),
confidence=0.211864406779661, lift=3.216993755575379)]]
RelationRecord(items=frozenset({'milk', 'shrimp', 'spaghetti', 'mineral
water'}), support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk', 'mineral
water'}), items_add=frozenset({'shrimp', 'spaghetti'}),
confidence=0.06388888888888889, lift=3.014028651292803),
OrderedStatistic(items_base=frozenset({'milk', 'spaghetti'}),
items_add=frozenset({'shrimp', 'mineral water'}),
confidence=0.08646616541353383, lift=3.6643090777791936),
OrderedStatistic(items_base=frozenset({'shrimp', 'mineral water'}),
items_add=frozenset({'milk', 'spaghetti'}), confidence=0.12994350282485875,
lift=3.6643090777791936), OrderedStatistic(items_base=frozenset({'shrimp',
'spaghetti'}), items_add=frozenset({'milk', 'mineral water'}),
confidence=0.14465408805031446, lift=3.014028651292802)]]
RelationRecord(items=frozenset({'milk', 'tomatoes', 'spaghetti', 'mineral
water'}), support=0.003332888948140248,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'tomatoes'}),
items_add=frozenset({'milk', 'spaghetti', 'mineral water'}),
confidence=0.04873294346978558, lift=3.097845838702217),
OrderedStatistic(items_base=frozenset({'milk', 'mineral water'}),
items_add=frozenset({'tomatoes', 'spaghetti'}), confidence=0.06944444444444445,
lift=3.3178520877565467), OrderedStatistic(items_base=frozenset({'milk',
'spaghetti'}), items_add=frozenset({'tomatoes', 'mineral water'}),
confidence=0.09398496240601503, lift=3.8523563005875343),
OrderedStatistic(items_base=frozenset({'milk', 'tomatoes'}),
items_add=frozenset({'spaghetti', 'mineral water'}),

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confidence=0.2380952380952381, lift=3.9865008503401365),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'milk', 'tomatoes'}), confidence=0.05580357142857143,
lift=3.9865008503401365), OrderedStatistic(items_base=frozenset({'tomatoes',
'mineral water'}), items_add=frozenset({'milk', 'spaghetti'}),
confidence=0.1366120218579235, lift=3.8523563005875348),
OrderedStatistic(items_base=frozenset({'tomatoes', 'spaghetti'}),
items_add=frozenset({'milk', 'mineral water'}), confidence=0.15923566878980894,
lift=3.3178520877565467), OrderedStatistic(items_base=frozenset({'milk',
'spaghetti', 'mineral water'}), items_add=frozenset({'tomatoes'}),
confidence=0.211864406779661, lift=3.0978458387022165)])
RelationRecord(items=frozenset({'chocolate', 'eggs', 'ground beef', '0',
'mineral water'}), support=0.003999466737768298,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'eggs', 'chocolate', '0', 'mineral water'}),
confidence=0.0407055630936228, lift=3.023093354111531),
OrderedStatistic(items_base=frozenset({'ground beef', '0'}),
items_add=frozenset({'eggs', 'chocolate', 'mineral water'}),
confidence=0.0407055630936228, lift=3.023093354111531),
OrderedStatistic(items_base=frozenset({'chocolate', 'ground beef'}),
items_add=frozenset({'eggs', '0', 'mineral water'}),
confidence=0.17341040462427748, lift=3.4051084949913752),
OrderedStatistic(items_base=frozenset({'chocolate', 'mineral water'}),
items_add=frozenset({'eggs', 'ground beef', '0'}),
confidence=0.0759493670886076, lift=3.7979746835443042),
OrderedStatistic(items_base=frozenset({'eggs', 'ground beef'}),
items_add=frozenset({'chocolate', '0', 'mineral water'}),
confidence=0.20000000000000004, lift=3.7979746835443047),
OrderedStatistic(items_base=frozenset({'eggs', 'mineral water'}),
items_add=frozenset({'chocolate', 'ground beef', '0'}),
confidence=0.07853403141361257, lift=3.405108494991375),
OrderedStatistic(items_base=frozenset({'chocolate', 'ground beef', '0'}),
items_add=frozenset({'eggs', 'mineral water'}), confidence=0.17341040462427748,
lift=3.4051084949913752), OrderedStatistic(items_base=frozenset({'chocolate',
'0', 'mineral water'}), items_add=frozenset({'eggs', 'ground beef'}),
confidence=0.0759493670886076, lift=3.7979746835443042),
OrderedStatistic(items_base=frozenset({'eggs', 'ground beef', '0'}),
items_add=frozenset({'chocolate', 'mineral water'}),
confidence=0.20000000000000004, lift=3.7979746835443047),
OrderedStatistic(items_base=frozenset({'eggs', '0', 'mineral water'}),
items_add=frozenset({'chocolate', 'ground beef'}),
confidence=0.07853403141361257, lift=3.405108494991375),
OrderedStatistic(items_base=frozenset({'eggs', 'chocolate', 'mineral water'}),
items_add=frozenset({'ground beef', '0'}), confidence=0.29702970297029707,
lift=3.023093354111531), OrderedStatistic(items_base=frozenset({'eggs',
'chocolate', '0', 'mineral water'}), items_add=frozenset({'ground beef'}),
confidence=0.29702970297029707, lift=3.023093354111531)])
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'spaghetti')), support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'chocolate', 'ground
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confidence=0.13294797687861273, lift=3.6395721699506356),
OrderedStatistic(items_base=frozenset({'chocolate', 'spaghetti'}),
items_add=frozenset({'eggs', 'ground beef', '0'}),
confidence=0.0782312925170068, lift=3.912086167800454),
OrderedStatistic(items_base=frozenset({'eggs', 'ground beef'}),
items_add=frozenset({'chocolate', '0', 'spaghetti'}),
confidence=0.15333333333333335, lift=3.912086167800454),
OrderedStatistic(items_base=frozenset({'eggs', 'spaghetti'}),
items_add=frozenset({'chocolate', 'ground beef', '0'}),
confidence=0.08394160583941607, lift=3.6395721699506356),
OrderedStatistic(items_base=frozenset({'chocolate', 'ground beef', '0'}),
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lift=3.6395721699506356), OrderedStatistic(items_base=frozenset({'chocolate',
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confidence=0.0782312925170068, lift=3.912086167800454),
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lift=3.912086167800454), OrderedStatistic(items_base=frozenset({'eggs', '0',
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confidence=0.08394160583941607, lift=3.6395721699506356)])
RelationRecord(items=frozenset({'chocolate', 'ground beef', '0', 'frozen
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'chocolate', 'ground beef', '0', 'mineral
water'}), confidence=0.03496503496503497, lift=3.1984478935698455),
OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'frozen vegetables', 'chocolate', '0', 'mineral water'}),
confidence=0.033921302578019, lift=3.4855300087358976),
OrderedStatistic(items_base=frozenset({'frozen vegetables', '0'}),
items_add=frozenset({'chocolate', 'ground beef', 'mineral water'}),
confidence=0.03496503496503497, lift=3.1984478935698455),
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items_add=frozenset({'frozen vegetables', 'chocolate', 'mineral water'}),
confidence=0.033921302578019, lift=3.4855300087358976),
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confidence=0.14534883720930233, lift=3.5513408075145825),
OrderedStatistic(items_base=frozenset({'chocolate', 'ground beef'}),
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confidence=0.14450867052023122, lift=4.044625140194979),
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confidence=0.06329113924050633, lift=3.738164058606598),
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items_add=frozenset({'chocolate', '0', 'mineral water'}),

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confidence=0.19685039370078738, lift=3.738164058606598),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'mineral water'}),
items_add=frozenset({'chocolate', 'ground beef', '0'}),
confidence=0.09328358208955223, lift=4.044625140194979),
OrderedStatistic(items_base=frozenset({'ground beef', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'chocolate', '0'}),
confidence=0.08143322475570033, lift=3.551340807514583),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'chocolate', '0'}),
items_add=frozenset({'ground beef', 'mineral water'}),
confidence=0.14534883720930233, lift=3.5513408075145825),
OrderedStatistic(items_base=frozenset({'chocolate', 'ground beef', '0'}),
items_add=frozenset({'frozen vegetables', 'mineral water'}),
confidence=0.14450867052023122, lift=4.044625140194979),
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confidence=0.06329113924050633, lift=3.738164058606598),
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confidence=0.19685039370078738, lift=3.738164058606598),
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confidence=0.09328358208955223, lift=4.044625140194979),
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items_add=frozenset({'frozen vegetables', 'chocolate'}),
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confidence=0.34246575342465757, lift=3.4855300087358976),
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confidence=0.30487804878048785, lift=3.1984478935698455),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'chocolate', '0',
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confidence=0.34246575342465757, lift=3.4855300087358976),
OrderedStatistic(items_base=frozenset({'chocolate', 'ground beef', '0', 'mineral
water'}), items_add=frozenset({'frozen vegetables'}),
confidence=0.30487804878048785, lift=3.1984478935698455)])
RelationRecord(items=frozenset({'chocolate', 'ground beef', '0', 'spaghetti',
'frozen vegetables'}), support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'chocolate', 'ground beef', '0',
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OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'frozen vegetables', 'chocolate', '0', 'spaghetti'}),
confidence=0.03120759837177748, lift=3.967596531978015),
OrderedStatistic(items_base=frozenset({'spaghetti'}),
items_add=frozenset({'frozen vegetables', 'chocolate', 'ground beef', '0'}),
confidence=0.01761102603369066, lift=3.0721001460165964),

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OrderedStatistic(items_base=frozenset({'frozen vegetables', '0'}),
items_add=frozenset({'chocolate', 'ground beef', 'spaghetti'}),
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items_add=frozenset({'frozen vegetables', 'chocolate', 'spaghetti'}),
confidence=0.03120759837177748, lift=3.967596531978015),
OrderedStatistic(items_base=frozenset({'0', 'spaghetti'}),
items_add=frozenset({'frozen vegetables', 'chocolate', 'ground beef'}),
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items_add=frozenset({'ground beef', '0', 'spaghetti'}),
confidence=0.13372093023255816, lift=3.411703053314349),
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OrderedStatistic(items_base=frozenset({'frozen vegetables', 'ground beef'}),
items_add=frozenset({'chocolate', '0', 'spaghetti'}),
confidence=0.1811023622047244, lift=4.620574213937543),
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items_add=frozenset({'chocolate', 'ground beef', '0'}),
confidence=0.11004784688995216, lift=4.771496529026192),
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items_add=frozenset({'frozen vegetables', 'chocolate', '0'}),
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items_add=frozenset({'ground beef', 'spaghetti'}),
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OrderedStatistic(items_base=frozenset({'chocolate', 'ground beef', '0'}),
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items_add=frozenset({'frozen vegetables', 'ground beef'}),
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confidence=0.1811023622047244, lift=4.620574213937543),
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items_add=frozenset({'chocolate', 'ground beef'}),
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items_add=frozenset({'frozen vegetables', 'chocolate'}),
confidence=0.0782312925170068, lift=3.4117030533143495),
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beef'}), items_add=frozenset({'0', 'spaghetti'}), confidence=0.5348837209302326,
lift=3.0721001460165964), OrderedStatistic(items_base=frozenset({'frozen

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vegetables', 'chocolate', 'spaghetti'}), items_add=frozenset({'ground beef',
'0'}), confidence=0.3898305084745763, lift=3.967596531978015),
OrderedStatistic(items_base=frozenset({'chocolate', 'ground beef',
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confidence=0.3333333333333337, lift=3.4969696969696975),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'chocolate', 'ground
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beef'}), confidence=0.3898305084745763, lift=3.967596531978015),
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confidence=0.3333333333333337, lift=3.4969696969696975)])
RelationRecord(items=frozenset({'chocolate', 'milk', '0', 'frozen vegetables',
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items_add=frozenset({'frozen vegetables', 'chocolate', '0', 'mineral water'}),
confidence=0.030864197530864203, lift=3.1714019956029094),
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items_add=frozenset({'frozen vegetables', 'chocolate', 'mineral water'}),
confidence=0.030864197530864203, lift=3.1714019956029094),
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items_add=frozenset({'frozen vegetables', '0', 'mineral water'}),
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items_add=frozenset({'frozen vegetables', 'milk', '0'}),
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items_add=frozenset({'chocolate', '0', 'mineral water'}),
confidence=0.16949152542372883, lift=3.2186226131731392),
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lift=3.484083730723974), OrderedStatistic(items_base=frozenset({'milk', 'mineral
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confidence=0.08333333333333334, lift=3.6342054263565897),
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items_add=frozenset({'milk', 'mineral water'}), confidence=0.17441860465116282,
lift=3.63420542635659), OrderedStatistic(items_base=frozenset({'milk',
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items_add=frozenset({'chocolate', 'mineral water'}),

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confidence=0.16949152542372883, lift=3.2186226131731392),
OrderedStatistic(items_base=frozenset({'frozen vegetables', '0', 'mineral
water'}), items_add=frozenset({'milk', 'chocolate'}),
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lift=3.1714019956029094)])
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lift=4.262677041440811), OrderedStatistic(items_base=frozenset({'milk',
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items_add=frozenset({'frozen vegetables', 'milk', '0'}),
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OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk'}),
items_add=frozenset({'chocolate', '0', 'spaghetti'}),
confidence=0.14689265536723162, lift=3.747761251393212),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'spaghetti'}),
items_add=frozenset({'milk', 'chocolate', '0'}), confidence=0.12440191387559808,
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lift=4.262677041440811), OrderedStatistic(items_base=frozenset({'milk',
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items_add=frozenset({'frozen vegetables', 'milk'}),
confidence=0.08843537414965985, lift=3.747761251393212),
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items_add=frozenset({'frozen vegetables', 'chocolate'}),
confidence=0.09774436090225563, lift=4.262677041440812),
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items_add=frozenset({'frozen vegetables', '0'}), confidence=0.3170731707317073,
lift=3.3263858093126384), OrderedStatistic(items_base=frozenset({'frozen
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confidence=0.44067796610169485, lift=3.4007463207086555),
OrderedStatistic(items_base=frozenset({'milk', 'chocolate', '0', 'spaghetti'}),
items_add=frozenset({'frozen vegetables'}), confidence=0.3170731707317073,
lift=3.3263858093126384)])
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
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confidence=0.04477611940298507, lift=4.600899611531384),
OrderedStatistic(items_base=frozenset({'frozen vegetables', '0'}),
items_add=frozenset({'chocolate', 'shrimp', 'mineral water'}),
confidence=0.033566433566433566, lift=4.417224880382775),
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items_add=frozenset({'frozen vegetables', 'chocolate', 'mineral water'}),
confidence=0.04485981308411215, lift=4.609499423889387),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'chocolate'}),
items_add=frozenset({'shrimp', '0', 'mineral water'}),
confidence=0.13953488372093026, lift=5.946881606765329),
OrderedStatistic(items_base=frozenset({'chocolate', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'shrimp', '0'}),
confidence=0.06075949367088608, lift=3.6460556962025317),
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items_add=frozenset({'frozen vegetables', '0', 'mineral water'}),
confidence=0.17777777777777778, lift=4.975787728026535),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'mineral water'}),
items_add=frozenset({'chocolate', 'shrimp', '0'}),
confidence=0.08955223880597014, lift=4.975787728026535),
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items_add=frozenset({'chocolate', '0', 'mineral water'}), confidence=0.192,
lift=3.6460556962025317), OrderedStatistic(items_base=frozenset({'shrimp',
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confidence=0.13559322033898305, lift=5.913283405597162),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'chocolate', '0'}),
items_add=frozenset({'shrimp', 'mineral water'}),
confidence=0.13953488372093026, lift=5.913283405597163),
OrderedStatistic(items_base=frozenset({'chocolate', '0', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'shrimp'}),
confidence=0.06075949367088608, lift=3.6460556962025317),
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items_add=frozenset({'frozen vegetables', 'mineral water'}),
confidence=0.1777777777777778, lift=4.975787728026535),
OrderedStatistic(items_base=frozenset({'frozen vegetables', '0', 'mineral
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confidence=0.13636363636363635, lift=5.946881606765327),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'chocolate',
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confidence=0.32876712328767127, lift=4.609499423889387),
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items_add=frozenset({'frozen vegetables', '0'}), confidence=0.4210526315789474,
lift=4.417224880382776), OrderedStatistic(items_base=frozenset({'frozen
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items_add=frozenset({'shrimp'}), confidence=0.32876712328767127,
lift=4.600899611531385), OrderedStatistic(items_base=frozenset({'chocolate',
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confidence=0.4210526315789474, lift=4.417224880382776)])
RelationRecord(items=frozenset({'chocolate', 'spaghetti', '0', 'frozen
vegetables', 'mineral water'}), support=0.0041327822956939075,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen vegetables',
'chocolate'}), items_add=frozenset({'0', 'spaghetti', 'mineral water'}),
confidence=0.1802325581395349, lift=3.0176884343853825),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'chocolate', '0'}),
confidence=0.06919642857142858, lift=3.0176884343853825),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'chocolate', '0'}),
items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.1802325581395349, lift=3.0176884343853825),
OrderedStatistic(items_base=frozenset({'spaghetti', '0', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'chocolate'}),
confidence=0.06919642857142858, lift=3.0176884343853825)])
RelationRecord(items=frozenset({'chocolate', 'milk', 'ground beef', '0',
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'chocolate', 'ground
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confidence=0.14450867052023122, lift=3.0109987154784847),
OrderedStatistic(items_base=frozenset({'milk', 'mineral water'}),
items_add=frozenset({'chocolate', 'ground beef', '0'}),
confidence=0.06944444444444445, lift=3.0109987154784843),
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items_add=frozenset({'milk', 'mineral water'}), confidence=0.14450867052023122,
lift=3.0109987154784847), OrderedStatistic(items_base=frozenset({'milk', '0',
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confidence=0.06944444444444445, lift=3.0109987154784843)])
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'chocolate', '0', 'spaghetti', 'mineral water'}),
confidence=0.058704453441295545, lift=3.700353825740822),
OrderedStatistic(items_base=frozenset({'olive oil', '0'}),
items_add=frozenset({'chocolate', 'spaghetti', 'mineral water'}),
confidence=0.0588235294117647, lift=3.707859614434008),
OrderedStatistic(items_base=frozenset({'chocolate', 'mineral water'}),
items_add=frozenset({'0', 'olive oil', 'spaghetti'}),
confidence=0.07341772151898734, lift=3.201780983220489),
OrderedStatistic(items_base=frozenset({'chocolate', 'olive oil'}),
items_add=frozenset({'0', 'spaghetti', 'mineral water'}),
confidence=0.23577235772357724, lift=3.947608159117306),
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items_add=frozenset({'olive oil', '0', 'mineral water'}),
confidence=0.09863945578231292, lift=3.5917211544812098),
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items_add=frozenset({'chocolate', '0', 'spaghetti'}),
confidence=0.1400966183574879, lift=3.5743698445561796),
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items_add=frozenset({'chocolate', 'olive oil', '0'}),
confidence=0.06473214285714286, lift=3.947608159117306),
OrderedStatistic(items_base=frozenset({'olive oil', 'spaghetti'}),
items_add=frozenset({'chocolate', '0', 'mineral water'}),
confidence=0.1686046511627907, lift=3.2017809832204884),
OrderedStatistic(items_base=frozenset({'chocolate', '0', 'mineral water'}),
items_add=frozenset({'olive oil', 'spaghetti'}), confidence=0.07341772151898734,
lift=3.201780983220489), OrderedStatistic(items_base=frozenset({'chocolate',
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confidence=0.23577235772357724, lift=3.947608159117306),
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items_add=frozenset({'olive oil', 'mineral water'}),
confidence=0.09863945578231292, lift=3.5743698445561796),
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items_add=frozenset({'chocolate', 'spaghetti'}), confidence=0.1407766990291262,
lift=3.5917211544812098), OrderedStatistic(items_base=frozenset({'spaghetti',

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'0', 'mineral water'})), items_add=frozenset({'chocolate', 'olive oil'}),
confidence=0.06473214285714286, lift=3.947608159117306),
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items_add=frozenset({'chocolate', 'mineral water'}),
confidence=0.1686046511627907, lift=3.2017809832204884),
OrderedStatistic(items_base=frozenset({'chocolate', 'spaghetti', 'mineral
water'})), items_add=frozenset({'olive oil', '0'}),
confidence=0.2436974789915966, lift=3.707859614434008),
OrderedStatistic(items_base=frozenset({'spaghetti', 'chocolate', '0', 'mineral
water'})), items_add=frozenset({'olive oil'}), confidence=0.2436974789915966,
lift=3.700353825740822)])
RelationRecord(items=frozenset({'chocolate', 'spaghetti', '0', 'pancakes',
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'chocolate',
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confidence=0.1879194630872483, lift=3.1463926174496644),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'chocolate', 'pancakes', '0'}), confidence=0.0625,
lift=3.1463926174496644), OrderedStatistic(items_base=frozenset({'chocolate',
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confidence=0.1879194630872483, lift=3.1463926174496644),
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items_add=frozenset({'chocolate', 'pancakes'}), confidence=0.0625,
lift=3.1463926174496644)])
RelationRecord(items=frozenset({'chocolate', 'shrimp', 'spaghetti', '0',
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'shrimp'}),
items_add=frozenset({'chocolate', '0', 'spaghetti', 'mineral water'}),
confidence=0.04850746268656716, lift=3.0576006522011783),
OrderedStatistic(items_base=frozenset({'shrimp', '0'}),
items_add=frozenset({'chocolate', 'spaghetti', 'mineral water'}),
confidence=0.048598130841121495, lift=3.0633157936071624),
OrderedStatistic(items_base=frozenset({'chocolate', 'mineral water'}),
items_add=frozenset({'shrimp', '0', 'spaghetti'}),
confidence=0.06582278481012657, lift=3.10526231987899),
OrderedStatistic(items_base=frozenset({'chocolate', 'shrimp'}),
items_add=frozenset({'0', 'spaghetti', 'mineral water'}),
confidence=0.1925925925925926, lift=3.2246362433862434),
OrderedStatistic(items_base=frozenset({'chocolate', 'spaghetti'}),
items_add=frozenset({'shrimp', '0', 'mineral water'}),
confidence=0.08843537414965985, lift=3.7690553494124917),
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items_add=frozenset({'chocolate', '0', 'spaghetti'}),
confidence=0.14689265536723162, lift=3.747761251393212),
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items_add=frozenset({'chocolate', '0', 'mineral water'}),
confidence=0.16352201257861634, lift=3.10526231987899),
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lift=3.10526231987899), OrderedStatistic(items_base=frozenset({'chocolate',
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items_add=frozenset({'shrimp', 'mineral water'}),
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confidence=0.05803571428571428, lift=3.2246362433862434),
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confidence=0.16352201257861634, lift=3.10526231987899),
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lift=3.063315793607162), OrderedStatistic(items_base=frozenset({'spaghetti',
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confidence=0.21848739495798317, lift=3.0576006522011783)])
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk'}),
items_add=frozenset({'frozen vegetables', 'eggs', '0', 'mineral water'}),
confidence=0.02880658436213992, lift=3.177620430888405),
OrderedStatistic(items_base=frozenset({'milk', '0'}),
items_add=frozenset({'frozen vegetables', 'eggs', 'mineral water'}),
confidence=0.02880658436213992, lift=3.177620430888405),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'eggs'}),
items_add=frozenset({'milk', '0', 'mineral water'}),
confidence=0.17177914110429446, lift=3.5792092706203134),
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items_add=frozenset({'frozen vegetables', 'milk', '0'}),
confidence=0.07329842931937172, lift=3.106279764545804),
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items_add=frozenset({'eggs', '0', 'mineral water'}),
confidence=0.1581920903954802, lift=3.106279764545804),
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lift=3.3925825418362727), OrderedStatistic(items_base=frozenset({'milk',
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confidence=0.07777777777777778, lift=3.5792092706203134),

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OrderedStatistic(items_base=frozenset({'frozen vegetables', 'eggs', '0'}),
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confidence=0.121212121212122, lift=3.392582541836273),
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confidence=0.07777777777777778, lift=3.5792092706203134),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'eggs', 'mineral
water'}), items_add=frozenset({'milk', '0'}), confidence=0.411764705882353,
lift=3.177620430888405), OrderedStatistic(items_base=frozenset({'frozen
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confidence=0.411764705882353, lift=3.177620430888405)])
RelationRecord(items=frozenset({'eggs', 'milk', 'ground beef', '0', 'mineral
water'}), support=0.003332888948140248,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'eggs', 'ground
beef'}), items_add=frozenset({'milk', '0', 'mineral water'}),
confidence=0.16666666666666669, lift=3.4726851851851857),
OrderedStatistic(items_base=frozenset({'milk', 'mineral water'}),
items_add=frozenset({'eggs', 'ground beef', '0'}),
confidence=0.06944444444444445, lift=3.4726851851851857),
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items_add=frozenset({'milk', 'mineral water'}), confidence=0.16666666666666669,
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confidence=0.06944444444444445, lift=3.4726851851851857)])
RelationRecord(items=frozenset({'eggs', 'ground beef', 'spaghetti', '0',
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'eggs', 'ground
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items_add=frozenset({'eggs', 'ground beef', '0'}),
confidence=0.06473214285714286, lift=3.237038690476191),
OrderedStatistic(items_base=frozenset({'eggs', 'ground beef', '0'}),
items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.19333333333333336, lift=3.237038690476191),
OrderedStatistic(items_base=frozenset({'spaghetti', '0', 'mineral water'}),
items_add=frozenset({'eggs', 'ground beef'}), confidence=0.06473214285714286,
lift=3.237038690476191)])

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RelationRecord(items=frozenset({'milk', 'spaghetti', '0', 'frozen smoothie',
'mineral water'}), support=0.003199573390214638,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen smoothie'}),
items_add=frozenset({'milk', '0', 'spaghetti', 'mineral water'}),
confidence=0.05052631578947369, lift=3.2118465655664585),
OrderedStatistic(items_base=frozenset({'milk'}), items_add=frozenset({'0',
'frozen smoothie', 'spaghetti', 'mineral water'}),
confidence=0.02469135802469136, lift=3.6315662067296057),
OrderedStatistic(items_base=frozenset({'frozen smoothie', '0'}),
items_add=frozenset({'milk', 'spaghetti', 'mineral water'}),
confidence=0.05063291139240506, lift=3.218622613173139),
OrderedStatistic(items_base=frozenset({'milk', '0'}),
items_add=frozenset({'frozen smoothie', 'spaghetti', 'mineral water'}),
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items_add=frozenset({'0', 'spaghetti', 'mineral water'}),
confidence=0.22429906542056074, lift=3.7555073431241657),
OrderedStatistic(items_base=frozenset({'frozen smoothie', 'mineral water'}),
items_add=frozenset({'milk', '0', 'spaghetti'}), confidence=0.15789473684210528,
lift=4.452512861100119), OrderedStatistic(items_base=frozenset({'frozen
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confidence=0.20512820512820515, lift=4.274074074074075),
OrderedStatistic(items_base=frozenset({'milk', 'mineral water'}),
items_add=frozenset({'0', 'frozen smoothie', 'spaghetti'}),
confidence=0.06666666666666668, lift=4.274074074074075),
OrderedStatistic(items_base=frozenset({'milk', 'spaghetti'}),
items_add=frozenset({'frozen smoothie', '0', 'mineral water'}),
confidence=0.09022556390977443, lift=4.481999701239855),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'milk', 'frozen smoothie', '0'}),
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OrderedStatistic(items_base=frozenset({'milk', 'frozen smoothie', '0'}),
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items_add=frozenset({'milk', 'mineral water'}), confidence=0.20512820512820515,
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confidence=0.06666666666666668, lift=4.274074074074075),
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items_add=frozenset({'frozen smoothie', 'mineral water'}),
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OrderedStatistic(items_base=frozenset({'frozen smoothie', 'spaghetti', 'mineral
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confidence=0.2033898305084746, lift=3.218622613173139),
OrderedStatistic(items_base=frozenset({'spaghetti', 'frozen smoothie', '0',
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lift=3.631566206729606), OrderedStatistic(items_base=frozenset({'milk',
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confidence=0.2033898305084746, lift=3.211846565566459)])
RelationRecord(items=frozenset({'milk', 'ground beef', '0', 'frozen vegetables',
'mineral water'}), support=0.0037328356219170776,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
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water'}), confidence=0.03916083916083916, lift=3.5391018619934282),
OrderedStatistic(items_base=frozenset({'ground beef'}),
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confidence=0.037991858887381276, lift=3.433457030292132),
OrderedStatistic(items_base=frozenset({'milk'}), items_add=frozenset({'frozen
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confidence=0.02880658436213992, lift=3.1315679608755294),
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confidence=0.22047244094488186, lift=4.593788276465442),
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confidence=0.1581920903954802, lift=3.865142899206831),
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items_add=frozenset({'milk', 'ground beef', '0'}),
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OrderedStatistic(items_base=frozenset({'milk', 'ground beef'}),
items_add=frozenset({'frozen vegetables', '0', 'mineral water'}),
confidence=0.1696969696969697, lift=4.749615558570782),
OrderedStatistic(items_base=frozenset({'ground beef', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'milk', '0'}),
confidence=0.09120521172638436, lift=3.865142899206831),
OrderedStatistic(items_base=frozenset({'milk', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'ground beef', '0'}),
confidence=0.07777777777777778, lift=4.593788276465442),

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OrderedStatistic(items_base=frozenset({'frozen vegetables', 'ground beef',
'0'}), items_add=frozenset({'milk', 'mineral water'}),
confidence=0.22047244094488186, lift=4.593788276465442),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk', '0'}),
items_add=frozenset({'ground beef', 'mineral water'}),
confidence=0.1581920903954802, lift=3.865142899206831),
OrderedStatistic(items_base=frozenset({'frozen vegetables', '0', 'mineral
water'}), items_add=frozenset({'milk', 'ground beef'}),
confidence=0.10447761194029849, lift=4.749615558570782),
OrderedStatistic(items_base=frozenset({'milk', 'ground beef', '0'}),
items_add=frozenset({'frozen vegetables', 'mineral water'}),
confidence=0.1696969696969697, lift=4.749615558570782),
OrderedStatistic(items_base=frozenset({'ground beef', '0', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'milk'}),
confidence=0.09120521172638436, lift=3.865142899206831),
OrderedStatistic(items_base=frozenset({'milk', '0', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'ground beef'}),
confidence=0.07777777777777778, lift=4.593788276465442),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'ground beef',
'mineral water'}), items_add=frozenset({'milk', '0'}),
confidence=0.40579710144927533, lift=3.1315679608755294),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk', 'mineral
water'}), items_add=frozenset({'ground beef', '0'}),
confidence=0.3373493975903614, lift=3.4334570302921317),
OrderedStatistic(items_base=frozenset({'milk', 'ground beef', 'mineral water'}),
items_add=frozenset({'frozen vegetables', '0'}), confidence=0.3373493975903614,
lift=3.539101861993428), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'ground beef', '0', 'mineral water'}),
items_add=frozenset({'milk'}), confidence=0.40579710144927533,
lift=3.1315679608755294), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'milk', '0', 'mineral water'}), items_add=frozenset({'ground
beef'}), confidence=0.3373493975903614, lift=3.4334570302921317),
OrderedStatistic(items_base=frozenset({'milk', 'ground beef', '0', 'mineral
water'}), items_add=frozenset({'frozen vegetables'}),
confidence=0.3373493975903614, lift=3.539101861993428)])
RelationRecord(items=frozenset({'milk', 'ground beef', '0', 'spaghetti', 'frozen
vegetables'}), support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'milk', 'ground beef', '0', 'spaghetti'}),
confidence=0.03216783216783217, lift=3.3053549190535496),
OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'frozen vegetables', 'milk', '0', 'spaghetti'}),
confidence=0.03120759837177748, lift=3.77561605462424),
OrderedStatistic(items_base=frozenset({'spaghetti'}),
items_add=frozenset({'frozen vegetables', 'milk', 'ground beef', '0'}),
confidence=0.01761102603369066, lift=3.0721001460165964),
OrderedStatistic(items_base=frozenset({'frozen vegetables', '0'}),
items_add=frozenset({'milk', 'ground beef', 'spaghetti'}),

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confidence=0.03216783216783217, lift=3.3053549190535496),
OrderedStatistic(items_base=frozenset({'ground beef', '0'}),
items_add=frozenset({'frozen vegetables', 'milk', 'spaghetti'}),
confidence=0.03120759837177748, lift=3.77561605462424),
OrderedStatistic(items_base=frozenset({'0', 'spaghetti'}),
items_add=frozenset({'frozen vegetables', 'milk', 'ground beef'}),
confidence=0.01761102603369066, lift=3.0721001460165964),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'ground beef'}),
items_add=frozenset({'milk', '0', 'spaghetti'}), confidence=0.1811023622047244,
lift=5.1069504469836), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'milk'}), items_add=frozenset({'ground beef', '0', 'spaghetti'}),
confidence=0.12994350282485875, lift=3.315327260847842),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'spaghetti'}),
items_add=frozenset({'milk', 'ground beef', '0'}),
confidence=0.11004784688995216, lift=5.002841815282007),
OrderedStatistic(items_base=frozenset({'milk', 'ground beef'}),
items_add=frozenset({'frozen vegetables', '0', 'spaghetti'}),
confidence=0.1393939393939394, lift=5.002841815282007),
OrderedStatistic(items_base=frozenset({'ground beef', 'spaghetti'}),
items_add=frozenset({'frozen vegetables', 'milk', '0'}),
confidence=0.0782312925170068, lift=3.315327260847842),
OrderedStatistic(items_base=frozenset({'milk', 'spaghetti'}),
items_add=frozenset({'frozen vegetables', 'ground beef', '0'}),
confidence=0.08646616541353383, lift=5.1069504469836),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'ground beef',
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confidence=0.1811023622047244, lift=5.1069504469836),
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items_add=frozenset({'ground beef', 'spaghetti'}),
confidence=0.12994350282485875, lift=3.315327260847842),
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items_add=frozenset({'milk', 'ground beef'}), confidence=0.11004784688995216,
lift=5.002841815282007), OrderedStatistic(items_base=frozenset({'milk', 'ground
beef', '0'}), items_add=frozenset({'frozen vegetables', 'spaghetti'}),
confidence=0.1393939393939394, lift=5.002841815282007),
OrderedStatistic(items_base=frozenset({'ground beef', '0', 'spaghetti'}),
items_add=frozenset({'frozen vegetables', 'milk'}),
confidence=0.0782312925170068, lift=3.315327260847842),
OrderedStatistic(items_base=frozenset({'milk', '0', 'spaghetti'}),
items_add=frozenset({'frozen vegetables', 'ground beef'}),
confidence=0.08646616541353383, lift=5.1069504469836),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk', 'ground
beef'}), items_add=frozenset({'0', 'spaghetti'}), confidence=0.5348837209302326,
lift=3.0721001460165964), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'milk', 'spaghetti'}), items_add=frozenset({'ground beef', '0'}),
confidence=0.3709677419354839, lift=3.7756160546242397),
OrderedStatistic(items_base=frozenset({'milk', 'ground beef', 'spaghetti'}),
items_add=frozenset({'frozen vegetables', '0'}), confidence=0.3150684931506849,

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lift=3.305354919053549), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'milk', 'ground beef', '0'}), items_add=frozenset({'spaghetti'}),
confidence=0.5348837209302326, lift=3.0721001460165964),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk', '0',
'spaghetti'}), items_add=frozenset({'ground beef'}),
confidence=0.3709677419354839, lift=3.7756160546242397),
OrderedStatistic(items_base=frozenset({'milk', 'ground beef', '0',
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confidence=0.3150684931506849, lift=3.305354919053549)])
RelationRecord(items=frozenset({'ground beef', 'spaghetti', '0', 'frozen
vegetables', 'mineral water'}), support=0.004399413411545127,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'frozen vegetables', '0', 'spaghetti', 'mineral water'}),
confidence=0.04477611940298508, lift=3.731840796019901),
OrderedStatistic(items_base=frozenset({'ground beef', '0'}),
items_add=frozenset({'frozen vegetables', 'spaghetti', 'mineral water'}),
confidence=0.04477611940298508, lift=3.731840796019901),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'ground beef'}),
items_add=frozenset({'0', 'spaghetti', 'mineral water'}),
confidence=0.25984251968503935, lift=4.350622187851519),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'mineral water'}),
items_add=frozenset({'0', 'ground beef', 'spaghetti'}),
confidence=0.12313432835820895, lift=3.1416006701187937),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'spaghetti'}),
items_add=frozenset({'ground beef', '0', 'mineral water'}),
confidence=0.15789473684210528, lift=3.857877593005315),
OrderedStatistic(items_base=frozenset({'ground beef', 'mineral water'}),
items_add=frozenset({'frozen vegetables', '0', 'spaghetti'}),
confidence=0.10749185667752444, lift=3.857877593005315),
OrderedStatistic(items_base=frozenset({'ground beef', 'spaghetti'}),
items_add=frozenset({'frozen vegetables', '0', 'mineral water'}),
confidence=0.11224489795918367, lift=3.1416006701187937),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'ground beef', '0'}),
confidence=0.07366071428571429, lift=4.350622187851518),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'ground beef',
'0'}), items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.25984251968503935, lift=4.350622187851519),
OrderedStatistic(items_base=frozenset({'frozen vegetables', '0', 'mineral
water'}), items_add=frozenset({'ground beef', 'spaghetti'}),
confidence=0.12313432835820895, lift=3.1416006701187937),
OrderedStatistic(items_base=frozenset({'frozen vegetables', '0', 'spaghetti'}),
items_add=frozenset({'ground beef', 'mineral water'}),
confidence=0.15789473684210528, lift=3.857877593005315),
OrderedStatistic(items_base=frozenset({'ground beef', '0', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'spaghetti'}),
confidence=0.10749185667752444, lift=3.857877593005315),
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items_add=frozenset({'frozen vegetables', 'mineral water'}),
confidence=0.11224489795918367, lift=3.1416006701187937),
OrderedStatistic(items_base=frozenset({'spaghetti', '0', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'ground beef'}),
confidence=0.07366071428571429, lift=4.350622187851518),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'spaghetti',
'mineral water'}), items_add=frozenset({'ground beef', '0'}),
confidence=0.3666666666666667, lift=3.7318407960199007),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'spaghetti', '0',
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confidence=0.3666666666666667, lift=3.7318407960199007)])
RelationRecord(items=frozenset({'olive oil', 'milk', '0', 'frozen vegetables',
'mineral water'}), support=0.003332888948140248,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'milk', 'olive oil', '0', 'mineral water'}),
confidence=0.03496503496503497, lift=4.098011363636364),
OrderedStatistic(items_base=frozenset({'milk'}), items_add=frozenset({'frozen
vegetables', 'olive oil', '0', 'mineral water'}),
confidence=0.025720164609053502, lift=3.9372847904593944),
OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'frozen vegetables', 'milk', '0', 'mineral water'}),
confidence=0.05060728744939272, lift=4.573557387444516),
OrderedStatistic(items_base=frozenset({'frozen vegetables', '0'}),
items_add=frozenset({'milk', 'olive oil', 'mineral water'}),
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items_add=frozenset({'frozen vegetables', 'olive oil', 'mineral water'}),
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OrderedStatistic(items_base=frozenset({'olive oil', '0'}),
items_add=frozenset({'frozen vegetables', 'milk', 'mineral water'}),
confidence=0.05070993914807302, lift=4.582834380116816),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk'}),
items_add=frozenset({'olive oil', '0', 'mineral water'}),
confidence=0.14124293785310735, lift=5.143025615709505),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'mineral water'}),
items_add=frozenset({'milk', 'olive oil', '0'}), confidence=0.09328358208955223,
lift=5.4665636660447765), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'olive oil'}), items_add=frozenset({'milk', '0', 'mineral water'}),
confidence=0.29411764705882354, lift=6.12826797385621),
OrderedStatistic(items_base=frozenset({'milk', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'olive oil', '0'}),
confidence=0.06944444444444445, lift=6.128267973856209),
OrderedStatistic(items_base=frozenset({'milk', 'olive oil'}),
items_add=frozenset({'frozen vegetables', '0', 'mineral water'}),
confidence=0.19531250000000003, lift=5.4665636660447765),
OrderedStatistic(items_base=frozenset({'olive oil', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'milk', '0'}),
confidence=0.12077294685990338, lift=5.118180081334097),

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OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk', '0'}),
items_add=frozenset({'olive oil', 'mineral water'}),
confidence=0.14124293785310735, lift=5.118180081334097),
OrderedStatistic(items_base=frozenset({'frozen vegetables', '0', 'mineral
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confidence=0.09328358208955223, lift=5.4665636660447765),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'olive oil', '0'}),
items_add=frozenset({'milk', 'mineral water'}), confidence=0.29411764705882354,
lift=6.12826797385621), OrderedStatistic(items_base=frozenset({'milk', '0',
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OrderedStatistic(items_base=frozenset({'olive oil', '0', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'milk'}),
confidence=0.12135922330097088, lift=5.143025615709505),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk', 'mineral
water'}), items_add=frozenset({'olive oil', '0'}),
confidence=0.30120481927710846, lift=4.582834380116816),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'olive oil',
'mineral water'}), items_add=frozenset({'milk', '0'}),
confidence=0.5102040816326531, lift=3.937284790459394),
OrderedStatistic(items_base=frozenset({'milk', 'olive oil', 'mineral water'}),
items_add=frozenset({'frozen vegetables', '0'}), confidence=0.39062500000000006,
lift=4.098011363636364), OrderedStatistic(items_base=frozenset({'frozen
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confidence=0.30120481927710846, lift=4.573557387444516),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'olive oil', '0',
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lift=3.937284790459394), OrderedStatistic(items_base=frozenset({'milk', 'olive
oil', '0', 'mineral water'}), items_add=frozenset({'frozen vegetables'}),
confidence=0.39062500000000006, lift=4.098011363636364))]
RelationRecord(items=frozenset({'soup', 'milk', '0', 'frozen vegetables',
'mineral water'}), support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'milk', 'soup', '0', 'mineral water'}),
confidence=0.03216783216783217, lift=3.7701704545454553),
OrderedStatistic(items_base=frozenset({'milk'}), items_add=frozenset({'frozen
vegetables', 'soup', '0', 'mineral water'}), confidence=0.02366255144032922,
lift=4.670863114576566), OrderedStatistic(items_base=frozenset({'mineral
water'}), items_add=frozenset({'frozen vegetables', 'milk', 'soup', '0'}),
confidence=0.012863534675615214, lift=3.2163124533929905),
OrderedStatistic(items_base=frozenset({'soup'}), items_add=frozenset({'frozen
vegetables', 'milk', '0', 'mineral water'}), confidence=0.06068601583113457,
lift=5.484407286136632), OrderedStatistic(items_base=frozenset({'frozen
vegetables', '0'}), items_add=frozenset({'milk', 'soup', 'mineral water'}),
confidence=0.03216783216783217, lift=3.7701704545454553),

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OrderedStatistic(items_base=frozenset({'milk', '0'}),
items_add=frozenset({'frozen vegetables', 'soup', 'mineral water'}),
confidence=0.02366255144032922, lift=4.670863114576566),
OrderedStatistic(items_base=frozenset({'0', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'milk', 'soup'}),
confidence=0.012870733072188025, lift=3.2181122924827457),
OrderedStatistic(items_base=frozenset({'soup', '0'}),
items_add=frozenset({'frozen vegetables', 'milk', 'mineral water'}),
confidence=0.06068601583113457, lift=5.484407286136632),
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items_add=frozenset({'soup', '0', 'mineral water'}),
confidence=0.12994350282485875, lift=5.634139969302113),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'mineral water'}),
items_add=frozenset({'milk', 'soup', '0'}), confidence=0.08582089552238806,
lift=5.646864362398533), OrderedStatistic(items_base=frozenset({'frozen
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confidence=0.3833333333333333, lift=7.987175925925926),
OrderedStatistic(items_base=frozenset({'milk', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'soup', '0'}),
confidence=0.06388888888888889, lift=7.987175925925926),
OrderedStatistic(items_base=frozenset({'milk', 'soup'}),
items_add=frozenset({'frozen vegetables', '0', 'mineral water'}),
confidence=0.20175438596491227, lift=5.646864362398533),
OrderedStatistic(items_base=frozenset({'soup', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'milk', '0'}),
confidence=0.13294797687861273, lift=5.6341399693021135),
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confidence=0.08582089552238806, lift=5.646864362398533),
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items_add=frozenset({'milk', 'mineral water'}), confidence=0.3833333333333333,
lift=7.987175925925926), OrderedStatistic(items_base=frozenset({'milk', '0',
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confidence=0.06388888888888889, lift=7.987175925925926),
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items_add=frozenset({'frozen vegetables', 'mineral water'}),
confidence=0.20175438596491227, lift=5.646864362398533),
OrderedStatistic(items_base=frozenset({'soup', '0', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'milk'}),
confidence=0.13294797687861273, lift=5.6341399693021135),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk', 'mineral
water'}), items_add=frozenset({'soup', '0'}), confidence=0.27710843373493976,
lift=5.484407286136631), OrderedStatistic(items_base=frozenset({'frozen
vegetables', 'milk', 'soup'}), items_add=frozenset({'0', 'mineral water'}),
confidence=0.7666666666666666, lift=3.218112292482745),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'soup', 'mineral

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water'}), items_add=frozenset({'milk', '0'}), confidence=0.6052631578947368,
lift=4.670863114576565), OrderedStatistic(items_base=frozenset({'milk', 'soup',
'mineral water'}), items_add=frozenset({'frozen vegetables', '0'}),
confidence=0.35937500000000006, lift=3.7701704545454553),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk', '0',
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confidence=0.27710843373493976, lift=5.484407286136631),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'milk', 'soup',
'0'}), items_add=frozenset({'mineral water'}), confidence=0.7666666666666666,
lift=3.21631245339299), OrderedStatistic(items_base=frozenset({'frozen
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confidence=0.6052631578947368, lift=4.670863114576565),
OrderedStatistic(items_base=frozenset({'milk', 'soup', '0', 'mineral water'}),
items_add=frozenset({'frozen vegetables'}), confidence=0.35937500000000006,
lift=3.7701704545454553)])
RelationRecord(items=frozenset({'milk', 'spaghetti', '0', 'frozen vegetables',
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
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items_add=frozenset({'0', 'spaghetti', 'mineral water'}),
confidence=0.19209039548022597, lift=3.216227804681194),
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items_add=frozenset({'milk', '0', 'spaghetti'}), confidence=0.12686567164179102,
lift=3.5775165525754677), OrderedStatistic(items_base=frozenset({'frozen
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confidence=0.16267942583732056, lift=3.389606592238171),
OrderedStatistic(items_base=frozenset({'milk', 'mineral water'}),
items_add=frozenset({'frozen vegetables', '0', 'spaghetti'}),
confidence=0.09444444444444444, lift=3.389606592238171),
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items_add=frozenset({'frozen vegetables', '0', 'mineral water'}),
confidence=0.12781954887218044, lift=3.577516552575468),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'milk', '0'}),
confidence=0.07589285714285714, lift=3.216227804681194),
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items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.19209039548022597, lift=3.216227804681194),
OrderedStatistic(items_base=frozenset({'frozen vegetables', '0', 'mineral
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confidence=0.12686567164179102, lift=3.5775165525754677),
OrderedStatistic(items_base=frozenset({'frozen vegetables', '0', 'spaghetti'}),
items_add=frozenset({'milk', 'mineral water'}), confidence=0.16267942583732056,

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lift=3.389606592238171), OrderedStatistic(items_base=frozenset({'milk', '0',
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confidence=0.09444444444444444, lift=3.389606592238171),
OrderedStatistic(items_base=frozenset({'milk', '0', 'spaghetti'}),
items_add=frozenset({'frozen vegetables', 'mineral water'}),
confidence=0.12781954887218044, lift=3.577516552575468),
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confidence=0.07589285714285714, lift=3.216227804681194),
OrderedStatistic(items_base=frozenset({'milk', 'spaghetti', 'mineral water'}),
items_add=frozenset({'frozen vegetables', '0'}), confidence=0.28813559322033894,
lift=3.0228043143297376), OrderedStatistic(items_base=frozenset({'milk',
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confidence=0.28813559322033894, lift=3.0228043143297376)])
RelationRecord(items=frozenset({'shrimp', 'spaghetti', '0', 'frozen vegetables',
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
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OrderedStatistic(items_base=frozenset({'frozen vegetables', '0'}),
items_add=frozenset({'shrimp', 'spaghetti', 'mineral water'}),
confidence=0.03496503496503497, lift=4.098011363636364),
OrderedStatistic(items_base=frozenset({'shrimp', '0'}),
items_add=frozenset({'frozen vegetables', 'spaghetti', 'mineral water'}),
confidence=0.04672897196261683, lift=3.8946002076843205),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'mineral water'}),
items_add=frozenset({'shrimp', '0', 'spaghetti'}),
confidence=0.09328358208955223, lift=4.400755655683844),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'shrimp'}),
items_add=frozenset({'0', 'spaghetti', 'mineral water'}), confidence=0.2,
lift=3.3486607142857148), OrderedStatistic(items_base=frozenset({'frozen
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water'}), confidence=0.11961722488038279, lift=5.098004567203132),
OrderedStatistic(items_base=frozenset({'shrimp', 'mineral water'}),
items_add=frozenset({'frozen vegetables', '0', 'spaghetti'}),
confidence=0.14124293785310735, lift=5.069202281512719),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'frozen vegetables', 'shrimp', '0'}),
confidence=0.05580357142857143, lift=3.3486607142857143),
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items_add=frozenset({'frozen vegetables', '0', 'mineral water'}),
confidence=0.15723270440251574, lift=4.400755655683845),
OrderedStatistic(items_base=frozenset({'frozen vegetables', '0', 'mineral
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OrderedStatistic(items_base=frozenset({'frozen vegetables', 'shrimp', '0'}),
items_add=frozenset({'spaghetti', 'mineral water'}), confidence=0.2,
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OrderedStatistic(items_base=frozenset({'shrimp', '0', 'mineral water'}),
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confidence=0.14204545454545456, lift=5.098004567203132),
OrderedStatistic(items_base=frozenset({'spaghetti', '0', 'mineral water'}),
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confidence=0.05580357142857143, lift=3.3486607142857143),
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confidence=0.15723270440251574, lift=4.400755655683845),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'spaghetti',
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confidence=0.2777777777777778, lift=3.89460020768432),
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items_add=frozenset({'frozen vegetables', '0'}), confidence=0.39062500000000006,
lift=4.098011363636364), OrderedStatistic(items_base=frozenset({'frozen
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items_add=frozenset({'shrimp'}), confidence=0.2777777777777778,
lift=3.8873341625207294), OrderedStatistic(items_base=frozenset({'spaghetti',
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confidence=0.39062500000000006, lift=4.098011363636364)])
RelationRecord(items=frozenset({'tomatoes', 'spaghetti', '0', 'frozen
vegetables', 'mineral water'}), support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'frozen
vegetables'}), items_add=frozenset({'0', 'mineral water', 'tomatoes',
'spaghetti'}), confidence=0.03216783216783217, lift=3.4470129870129873),
OrderedStatistic(items_base=frozenset({'spaghetti'}),
items_add=frozenset({'frozen vegetables', '0', 'tomatoes', 'mineral water'}),
confidence=0.01761102603369066, lift=3.0022796881525826),
OrderedStatistic(items_base=frozenset({'tomatoes'}),
items_add=frozenset({'frozen vegetables', '0', 'spaghetti', 'mineral water'}),
confidence=0.04483430799220273, lift=3.736690491661252),
OrderedStatistic(items_base=frozenset({'frozen vegetables', '0'}),
items_add=frozenset({'mineral water', 'tomatoes', 'spaghetti'}),
confidence=0.03216783216783217, lift=3.4470129870129873),
OrderedStatistic(items_base=frozenset({'0', 'spaghetti'}),
items_add=frozenset({'frozen vegetables', 'tomatoes', 'mineral water'}),
confidence=0.01761102603369066, lift=3.0022796881525826),
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confidence=0.04483430799220273, lift=3.736690491661252),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'mineral water'}),
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confidence=0.08582089552238806, lift=4.1002709383021205),

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OrderedStatistic(items_base=frozenset({'frozen vegetables', 'spaghetti'}),
items_add=frozenset({'0', 'tomatoes', 'mineral water'}),
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OrderedStatistic(items_base=frozenset({'frozen vegetables', 'tomatoes'}),
items_add=frozenset({'0', 'spaghetti', 'mineral water'}),
confidence=0.1900826446280992, lift=3.1826114226682414),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'frozen vegetables', '0', 'tomatoes'}),
confidence=0.05133928571428572, lift=3.1826114226682414),
OrderedStatistic(items_base=frozenset({'tomatoes', 'mineral water'}),
items_add=frozenset({'frozen vegetables', '0', 'spaghetti'}),
confidence=0.12568306010928962, lift=4.510759013778858),
OrderedStatistic(items_base=frozenset({'tomatoes', 'spaghetti'}),
items_add=frozenset({'frozen vegetables', '0', 'mineral water'}),
confidence=0.14649681528662423, lift=4.1002709383021205),
OrderedStatistic(items_base=frozenset({'frozen vegetables', '0', 'mineral
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confidence=0.08582089552238806, lift=4.1002709383021205),
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confidence=0.11004784688995216, lift=4.510759013778858),
OrderedStatistic(items_base=frozenset({'frozen vegetables', 'tomatoes', '0'}),
items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.1900826446280992, lift=3.1826114226682414),
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OrderedStatistic(items_base=frozenset({'spaghetti', 'tomatoes', '0', 'mineral
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confidence=0.32857142857142857, lift=3.447012987012987)])
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk', 'ground
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confidence=0.2, lift=3.3486607142857148),
OrderedStatistic(items_base=frozenset({'ground beef', 'mineral water'}),
items_add=frozenset({'milk', '0', 'spaghetti'}), confidence=0.10749185667752444,
lift=3.0311895373613185), OrderedStatistic(items_base=frozenset({'milk',
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confidence=0.12406015037593984, lift=3.0311895373613185),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'milk', 'ground beef', '0'}),
confidence=0.07366071428571429, lift=3.3486607142857148),
OrderedStatistic(items_base=frozenset({'milk', 'ground beef', '0'}),
items_add=frozenset({'spaghetti', 'mineral water'}), confidence=0.2,
lift=3.3486607142857148), OrderedStatistic(items_base=frozenset({'ground beef',
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confidence=0.10749185667752444, lift=3.0311895373613185),
OrderedStatistic(items_base=frozenset({'milk', '0', 'spaghetti'}),
items_add=frozenset({'ground beef', 'mineral water'}),
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OrderedStatistic(items_base=frozenset({'spaghetti', '0', 'mineral water'}),
items_add=frozenset({'milk', 'ground beef'}), confidence=0.07366071428571429,
lift=3.3486607142857148)])
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'0', 'olive oil', 'spaghetti', 'mineral water'}),
confidence=0.03120759837177748, lift=3.040106433593544),
OrderedStatistic(items_base=frozenset({'ground beef', '0'}),
items_add=frozenset({'olive oil', 'spaghetti', 'mineral water'}),
confidence=0.03120759837177748, lift=3.040106433593544),
OrderedStatistic(items_base=frozenset({'ground beef', 'mineral water'}),
items_add=frozenset({'0', 'olive oil', 'spaghetti'}),
confidence=0.0749185667752443, lift=3.267233542913416),
OrderedStatistic(items_base=frozenset({'olive oil', 'ground beef'}),
items_add=frozenset({'0', 'spaghetti', 'mineral water'}),
confidence=0.2169811320754717, lift=3.63298096361186),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'ground beef', 'olive oil', '0'}),
confidence=0.05133928571428572, lift=3.63298096361186),
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items_add=frozenset({'ground beef', '0', 'mineral water'}),
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items_add=frozenset({'olive oil', 'spaghetti'}), confidence=0.0749185667752443,
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confidence=0.2169811320754717, lift=3.63298096361186),
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items_add=frozenset({'ground beef', 'olive oil'}),
confidence=0.05133928571428572, lift=3.63298096361186),
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items_add=frozenset({'ground beef', 'mineral water'}),
confidence=0.13372093023255816, lift=3.267233542913416),
OrderedStatistic(items_base=frozenset({'olive oil', 'spaghetti', 'mineral
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confidence=0.2987012987012987, lift=3.0401064335935435),
OrderedStatistic(items_base=frozenset({'spaghetti', 'olive oil', '0', 'mineral
water'}), items_add=frozenset({'ground beef'}), confidence=0.2987012987012987,
lift=3.0401064335935435)])
RelationRecord(items=frozenset({'ground beef', 'spaghetti', '0', 'pancakes',
'mineral water'}), support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef',
'pancakes'}), items_add=frozenset({'0', 'spaghetti', 'mineral water'}),
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OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'pancakes', 'ground beef', '0'}),
confidence=0.05133928571428572, lift=3.532990661861075),
OrderedStatistic(items_base=frozenset({'pancakes', 'ground beef', '0'}),
items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.21100917431192662, lift=3.532990661861075),
OrderedStatistic(items_base=frozenset({'spaghetti', '0', 'mineral water'}),
items_add=frozenset({'ground beef', 'pancakes'}),
confidence=0.05133928571428572, lift=3.532990661861075)])
RelationRecord(items=frozenset({'tomatoes', 'ground beef', 'spaghetti', '0',
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ordered_statistics=[OrderedStatistic(items_base=frozenset({'ground beef'}),
items_add=frozenset({'0', 'mineral water', 'tomatoes', 'spaghetti'}),
confidence=0.03120759837177748, lift=3.344117076952898),
OrderedStatistic(items_base=frozenset({'spaghetti'}), items_add=frozenset({'0',
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lift=3.221958689724723), OrderedStatistic(items_base=frozenset({'ground beef',
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confidence=0.03120759837177748, lift=3.344117076952898),
OrderedStatistic(items_base=frozenset({'0', 'spaghetti'}),
items_add=frozenset({'ground beef', 'tomatoes', 'mineral water'}),
confidence=0.01761102603369066, lift=3.221958689724723),
OrderedStatistic(items_base=frozenset({'ground beef', 'mineral water'}),
items_add=frozenset({'0', 'tomatoes', 'spaghetti'}),
confidence=0.0749185667752443, lift=3.579389613892405),
OrderedStatistic(items_base=frozenset({'ground beef', 'spaghetti'}),
items_add=frozenset({'0', 'tomatoes', 'mineral water'}),

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confidence=0.0782312925170068, lift=3.2066280063938146),
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items_add=frozenset({'0', 'spaghetti', 'mineral water'}),
confidence=0.26136363636363635, lift=4.3760907061688314),
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items_add=frozenset({'0', 'ground beef', 'tomatoes'}),
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confidence=0.12568306010928962, lift=3.206628006393814),
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items_add=frozenset({'ground beef', '0', 'mineral water'}),
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confidence=0.05133928571428572, lift=4.3760907061688314),
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items_add=frozenset({'ground beef', 'spaghetti'}),
confidence=0.12568306010928962, lift=3.206628006393814),
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items_add=frozenset({'ground beef', 'mineral water'}),
confidence=0.14649681528662423, lift=3.579389613892405),
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OrderedStatistic(items_base=frozenset({'tomatoes', 'spaghetti', 'mineral
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'tomatoes', '0', 'mineral water'}), items_add=frozenset({'ground beef'}),
confidence=0.32857142857142857, lift=3.344117076952898))]
RelationRecord(items=frozenset({'olive oil', 'milk', 'spaghetti', '0', 'mineral
water'}), support=0.003332888948140248,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'olive oil'}),
items_add=frozenset({'milk', '0', 'spaghetti', 'mineral water'}),
confidence=0.05060728744939272, lift=3.216993755575379),
OrderedStatistic(items_base=frozenset({'olive oil', '0'}),
items_add=frozenset({'milk', 'spaghetti', 'mineral water'}),

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confidence=0.05070993914807302, lift=3.223519097878777),
OrderedStatistic(items_base=frozenset({'milk', 'mineral water'}),
items_add=frozenset({'0', 'olive oil', 'spaghetti'}),
confidence=0.06944444444444445, lift=3.0285045219638245),
OrderedStatistic(items_base=frozenset({'milk', 'olive oil'}),
items_add=frozenset({'0', 'spaghetti', 'mineral water'}),
confidence=0.19531250000000003, lift=3.2701764787946432),
OrderedStatistic(items_base=frozenset({'milk', 'spaghetti'}),
items_add=frozenset({'olive oil', '0', 'mineral water'}),
confidence=0.09398496240601503, lift=3.4222388495510616),
OrderedStatistic(items_base=frozenset({'olive oil', 'mineral water'}),
items_add=frozenset({'milk', '0', 'spaghetti'}), confidence=0.12077294685990338,
lift=3.4057062947223127), OrderedStatistic(items_base=frozenset({'spaghetti',
'mineral water'}), items_add=frozenset({'milk', 'olive oil', '0'}),
confidence=0.05580357142857143, lift=3.2701764787946432),
OrderedStatistic(items_base=frozenset({'olive oil', 'spaghetti'}),
items_add=frozenset({'milk', '0', 'mineral water'}),
confidence=0.14534883720930233, lift=3.0285045219638245),
OrderedStatistic(items_base=frozenset({'milk', '0', 'mineral water'}),
items_add=frozenset({'olive oil', 'spaghetti'}), confidence=0.06944444444444445,
lift=3.0285045219638245), OrderedStatistic(items_base=frozenset({'milk', 'olive
oil', '0'}), items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.19531250000000003, lift=3.2701764787946432),
OrderedStatistic(items_base=frozenset({'milk', '0', 'spaghetti'}),
items_add=frozenset({'olive oil', 'mineral water'}),
confidence=0.09398496240601503, lift=3.4057062947223127),
OrderedStatistic(items_base=frozenset({'olive oil', '0', 'mineral water'}),
items_add=frozenset({'milk', 'spaghetti'}), confidence=0.12135922330097088,
lift=3.422238849551062), OrderedStatistic(items_base=frozenset({'spaghetti',
'0', 'mineral water'}), items_add=frozenset({'milk', 'olive oil'}),
confidence=0.05580357142857143, lift=3.2701764787946432),
OrderedStatistic(items_base=frozenset({'olive oil', '0', 'spaghetti'}),
items_add=frozenset({'milk', 'mineral water'}), confidence=0.14534883720930233,
lift=3.0285045219638245), OrderedStatistic(items_base=frozenset({'milk',
'spaghetti', 'mineral water'}), items_add=frozenset({'olive oil', '0'}),
confidence=0.211864406779661, lift=3.223519097878777),
OrderedStatistic(items_base=frozenset({'milk', 'spaghetti', '0', 'mineral
water'}), items_add=frozenset({'olive oil'}), confidence=0.211864406779661,
lift=3.216993755575379)])
RelationRecord(items=frozenset({'shrimp', 'milk', 'spaghetti', '0', 'mineral
water'}), support=0.0030662578322890282,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'milk', 'mineral
water'}), items_add=frozenset({'shrimp', '0', 'spaghetti'}),
confidence=0.06388888888888889, lift=3.014028651292803),
OrderedStatistic(items_base=frozenset({'milk', 'spaghetti'}),
items_add=frozenset({'shrimp', '0', 'mineral water'}),
confidence=0.08646616541353383, lift=3.6851290157211207),
OrderedStatistic(items_base=frozenset({'shrimp', 'mineral water'}),

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items_add=frozenset({'milk', '0', 'spaghetti'}), confidence=0.12994350282485875,
lift=3.6643090777791936), OrderedStatistic(items_base=frozenset({'shrimp',
'spaghetti'}), items_add=frozenset({'milk', '0', 'mineral water'}),
confidence=0.14465408805031446, lift=3.014028651292802),
OrderedStatistic(items_base=frozenset({'milk', '0', 'mineral water'}),
items_add=frozenset({'shrimp', 'spaghetti'}), confidence=0.06388888888888889,
lift=3.014028651292803), OrderedStatistic(items_base=frozenset({'milk', '0',
'spaghetti'}), items_add=frozenset({'shrimp', 'mineral water'}),
confidence=0.08646616541353383, lift=3.6643090777791936),
OrderedStatistic(items_base=frozenset({'shrimp', '0', 'mineral water'}),
items_add=frozenset({'milk', 'spaghetti'}), confidence=0.13068181818181818,
lift=3.6851290157211207), OrderedStatistic(items_base=frozenset({'shrimp', '0',
'spaghetti'}), items_add=frozenset({'milk', 'mineral water'}),
confidence=0.14465408805031446, lift=3.014028651292802))]
RelationRecord(items=frozenset({'tomatoes', 'milk', 'spaghetti', '0', 'mineral
water'}), support=0.003332888948140248,
ordered_statistics=[OrderedStatistic(items_base=frozenset({'tomatoes'}),
items_add=frozenset({'milk', '0', 'spaghetti', 'mineral water'}),
confidence=0.04873294346978558, lift=3.097845838702217),
OrderedStatistic(items_base=frozenset({'tomatoes', '0'}),
items_add=frozenset({'milk', 'spaghetti', 'mineral water'}),
confidence=0.04873294346978558, lift=3.097845838702217),
OrderedStatistic(items_base=frozenset({'milk', 'mineral water'}),
items_add=frozenset({'0', 'tomatoes', 'spaghetti'}),
confidence=0.06944444444444445, lift=3.3178520877565467),
OrderedStatistic(items_base=frozenset({'milk', 'spaghetti'}),
items_add=frozenset({'0', 'tomatoes', 'mineral water'}),
confidence=0.09398496240601503, lift=3.8523563005875343),
OrderedStatistic(items_base=frozenset({'milk', 'tomatoes'}),
items_add=frozenset({'0', 'spaghetti', 'mineral water'}),
confidence=0.2380952380952381, lift=3.9865008503401365),
OrderedStatistic(items_base=frozenset({'spaghetti', 'mineral water'}),
items_add=frozenset({'milk', '0', 'tomatoes'}), confidence=0.05580357142857143,
lift=3.9865008503401365), OrderedStatistic(items_base=frozenset({'tomatoes',
'mineral water'}), items_add=frozenset({'milk', '0', 'spaghetti'}),
confidence=0.1366120218579235, lift=3.8523563005875348),
OrderedStatistic(items_base=frozenset({'tomatoes', 'spaghetti'}),
items_add=frozenset({'milk', '0', 'mineral water'}),
confidence=0.15923566878980894, lift=3.3178520877565467),
OrderedStatistic(items_base=frozenset({'milk', '0', 'mineral water'}),
items_add=frozenset({'tomatoes', 'spaghetti'}), confidence=0.06944444444444445,
lift=3.3178520877565467), OrderedStatistic(items_base=frozenset({'milk', '0',
'spaghetti'}), items_add=frozenset({'tomatoes', 'mineral water'}),
confidence=0.09398496240601503, lift=3.8523563005875343),
OrderedStatistic(items_base=frozenset({'milk', 'tomatoes', '0'}),
items_add=frozenset({'spaghetti', 'mineral water'}),
confidence=0.2380952380952381, lift=3.9865008503401365),
OrderedStatistic(items_base=frozenset({'spaghetti', '0', 'mineral water'}),

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items_add=frozenset({'milk', 'tomatoes'}), confidence=0.05580357142857143,
lift=3.9865008503401365), OrderedStatistic(items_base=frozenset({'tomatoes',
'0', 'mineral water'}), items_add=frozenset({'milk', 'spaghetti'}),
confidence=0.1366120218579235, lift=3.8523563005875348),
OrderedStatistic(items_base=frozenset({'tomatoes', '0', 'spaghetti'}),
items_add=frozenset({'milk', 'mineral water'}), confidence=0.15923566878980894,
lift=3.3178520877565467), OrderedStatistic(items_base=frozenset({'milk',
'spaghetti', 'mineral water'}), items_add=frozenset({'0', 'tomatoes'}),
confidence=0.211864406779661, lift=3.0978458387022165),
OrderedStatistic(items_base=frozenset({'milk', 'spaghetti', '0', 'mineral
water'}), items_add=frozenset({'tomatoes'}), confidence=0.211864406779661,
lift=3.0978458387022165)])

```

```
[15]: print(len(Results))
```

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```
[16]: results=pd.DataFrame(Results)
      results.head()
```

```
[16]:
```

	items	support \
0	(brownies, cottage cheese)	0.003466
1	(light cream, chicken)	0.004533
2	(mushroom cream sauce, escalope)	0.005733
3	(pasta, escalope)	0.005866
4	(tomato juice, fresh bread)	0.004266

  

```

ordered_statistics
0 [((brownies), (cottage cheese), 0.102766798418...
1 [((chicken), (light cream), 0.0755555555555555...
2 [((escalope), (mushroom cream sauce), 0.072268...
3 [((escalope), (pasta), 0.07394957983193277, 4...
4 [((fresh bread), (tomato juice), 0.09907120743...

```

```
[ ]:
```