Group 4

# REDUCED MARKETBASKET DATA


# MEMBER

5 ณัชชา ประทุมชาติ

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# HOMEWORK 3

1. วิเคราะห์พฤติกรรมผู้บริโภค (GROUPBY CUSTOMER ID) แต่ละทวีป
2. ในทั้ง 7 วัน (MONDAY TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY SUNDAY) ของทวีปยุโรปสินค้าชนิดใดขายคู่กันดีที่สุดและอยู่ในวันใด

# จัดการข้อมูล



```
!pip install apyori
from apyori import apriori
```

```
import pandas as pd
import os
from google.colab import drive
drive.mount('/content/drive')
path = '/content/drive/MyDrive/bsc_dpdm_me/reduced_marketbasket.csv'
Data = pd.read_csv('/content/drive/MyDrive/bsc_dpdm_me/reduced_marketbasket.csv',encoding='latin-1')
Data
```

| | InvoiceNo | StockCode | Description | Quantity | InvoiceDate | UnitPrice | CustomerID | Country |
|---|---|---|---|---|---|---|---|---|
| **0** | 536365 | 85123A | WHITE HANGING HEART T-LIGHT HOLDER | 6 | 12/01/2010 08:26 | 2.55 | 17850.0 | United Kingdom |
| **1** | 536365 | 71053 | WHITE METAL LANTERN | 6 | 12/01/2010 08:26 | 3.39 | 17850.0 | United Kingdom |
| **2** | 536365 | 84406B | CREAM CUPID HEARTS COAT HANGER | 8 | 12/01/2010 08:26 | 2.75 | 17850.0 | United Kingdom |
| **3** | 536365 | 84029G | KNITTED UNION FLAG HOT WATER BOTTLE | 6 | 12/01/2010 08:26 | 3.39 | 17850.0 | United Kingdom |
| **4** | 536365 | 84029E | RED WOOLLY HOTTIE WHITE HEART. | 6 | 12/01/2010 08:26 | 3.39 | 17850.0 | United Kingdom |

# 1.วิเคราะห์พฤติกรรมผู้บริโภค (GROUPBY CUSTOMER ID) แต่ละทวีป



ดูว่าข้อมูลที่ให้มามีประเทศอะไรบ้างเพื่อจะมาจัดกลุ่มแต่ละทวีป
มีประเทศทั้งหมด 38 ประเทศ

```
Number of unique countries: 38
Unique Countries:
United Kingdom
France
Australia
Netherlands
Germany
Norway
EIRE
Switzerland
Spain
Poland
Portugal
Italy
Belgium
Lithuania
```

```
Japan
Iceland
Channel Islands
Denmark
Cyprus
Sweden
Austria
Israel
Finland
Bahrain
Greece
Hong Kong
Singapore
Lebanon
United Arab Emirates
Saudi Arabia
Czech Republic
Canada
Unspecified
Brazil
USA
European Community
Malta
RSA
```

# 1.วิเคราะห์พฤติกรรมผู้บริโภค (GROUPBY CUSTOMER ID) แต่ละทวีป



## แบ่งกลุ่มประเทศตามทวีป

```
country_continent = {
    'United Kingdom': 'Europe',
    'France': 'Europe',
    'Australia': 'Oceania',
    'Netherlands': 'Europe',
    'Germany': 'Europe',
    'Norway': 'Europe',
    'EIRE': 'Europe',  # Ireland
    'Switzerland': 'Europe',
    'Spain': 'Europe',
    'Poland': 'Europe',
    'Portugal': 'Europe',
    'Italy': 'Europe',
    'Belgium': 'Europe',
    'Lithuania': 'Europe',
    'Japan': 'Asia',
    'Iceland': 'Europe',
    'Channel Islands': 'Europe',
    'Denmark': 'Europe',
    'Cyprus': 'Europe',
    'Sweden': 'Europe',
    'Austria': 'Europe',
    'Israel': 'Asia',
    'Finland': 'Europe',
    'Bahrain': 'Asia',
    'Greece': 'Europe',
    'Singapore': 'Asia',
    'Lebanon': 'Asia',
    'United Arab Emirates': 'Asia',
    'Saudi Arabia': 'Asia',
    'Canada': 'North America',
    'Unspecified': 'Unknown',
    'Brazil': 'South America',
    'USA': 'North America',
    'European Community': 'Europe',
    'Malta': 'Europe',
    'RSA': 'South Africa'
}

# Add a 'Continent' column to the DataFrame
Data['Continent'] = Data['Country'].map(country_continent)

# Handle countries not in the mapping (fill with 'Unknown')
Data['Continent'].fillna('Unknown', inplace=True)
Data
```

| | InvoiceNo | StockCode | Description | Quantity | InvoiceDate | UnitPrice | CustomerID | Country | Continent |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 536365 | 85123A | WHITE HANGING HEART T-LIGHT HOLDER | 6 | 12/01/2010 08:26 | 2.55 | 17850.0 | United Kingdom | Europe |
| 1 | 536365 | 71053 | WHITE METAL LANTERN | 6 | 12/01/2010 08:26 | 3.39 | 17850.0 | United Kingdom | Europe |
| 2 | 536365 | 84406B | CREAM CUPID HEARTS COAT HANGER | 8 | 12/01/2010 08:26 | 2.75 | 17850.0 | United Kingdom | Europe |
| 3 | 536365 | 84029G | KNITTED UNION FLAG HOT WATER BOTTLE | 6 | 12/01/2010 08:26 | 3.39 | 17850.0 | United Kingdom | Europe |
| 4 | 536365 | 84029E | RED WOOLLY HOTTIE WHITE HEART. | 6 | 12/01/2010 08:26 | 3.39 | 17850.0 | United Kingdom | Europe |

# 1.วิเคราะห์พฤติกรรมผู้บริโภค (GROUPBY CUSTOMER ID) แต่ละทวีป



## ลบ 'Unknow'

```
# Count the number of unique continents
num_continents = Data['Continent'].nunique()
print(f"Number of unique continents: {num_continents}")

# Get a list of unique continents
unique_continents = Data['Continent'].unique()
print("Unique Continents:")
for continent in unique_continents:
    print(continent) # Indent this line to print each conti
```

```
Number of unique continents: 7
Unique Continents:
Europe
Oceania
Asia
Unknown
North America
South America
South Africa
```

```
# Remove rows where the continent is 'Unknown'
Data_new = Data[Data['Continent'] != 'Unknown']
Data_new
```

| | InvoiceNo | StockCode | Description | Quantity | InvoiceDate | UnitPrice | CustomerID | Country | Continent |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 536365 | 85123A | WHITE HANGING HEART T-LIGHT HOLDER | 6 | 12/01/2010 08:26 | 2.55 | 17850.0 | United Kingdom | Europe |
| 1 | 536365 | 71053 | WHITE METAL LANTERN | 6 | 12/01/2010 08:26 | 3.39 | 17850.0 | United Kingdom | Europe |
| 2 | 536365 | 84406B | CREAM CUPID HEARTS COAT HANGER | 8 | 12/01/2010 08:26 | 2.75 | 17850.0 | United Kingdom | Europe |
| 3 | 536365 | 84029G | KNITTED UNION FLAG HOT WATER BOTTLE | 6 | 12/01/2010 08:26 | 3.39 | 17850.0 | United Kingdom | Europe |
| 4 | 536365 | 84029E | RED WOOLLY HOTTIE WHITE HEART. | 6 | 12/01/2010 08:26 | 3.39 | 17850.0 | United Kingdom | Europe |

## หลังจากลบแล้วข้อมูลเหลือ 99.86%

```
# Calculate the percentage of remaining data
remaining_percentage = (len(Data_new) / len(Data)) * 100
print(f"Percentage of data remaining after removing 'Unknown' continents: {remaining_percentage:.2f}%")
```

```
Percentage of data remaining after removing 'Unknown' continents: 99.86%
```

# 1.วิเคราะห์พฤติกรรมผู้บริโภค (GROUPBY CUSTOMER ID) แต่ละทวีป



## ดูข้อมูลภาพรวมแต่ละทวีป

```
# Group data by continent and customer ID
continent_customer_analysis = Data_new.groupby('Continent')['CustomerID'].agg(['nunique', 'count'])
continent_customer_analysis = continent_customer_analysis.rename(columns={'nunique': 'Number of Customers', 'count': 'Number of Purchases'})

# Calculate average quantity and average sales per invoice
average_metrics = Data_new.groupby('Continent').agg(
    Average_Quantity=('Quantity', 'mean'),
    Average_Sales=('UnitPrice', 'mean')
)
# Round average quantity to the nearest integer
average_metrics['Average_Quantity'] = average_metrics['Average_Quantity'].round().astype(int)
average_metrics['Average_Sales'] = average_metrics['Average_Sales'].round(2)
result = pd.merge(continent_customer_analysis, average_metrics, on='Continent')
result
```

| Continent | Number of Customers | Number of Purchases | Average_Quantity | Average_Sales |
|---|---|---|---|---|
| Asia | 19 | 977 | 36 | 26.89 |
| Europe | 4331 | 403787 | 9 | 4.55 |
| North America | 8 | 442 | 9 | 3.52 |
| Oceania | 9 | 1259 | 66 | 3.22 |
| South Africa | 1 | 58 | 6 | 4.28 |
| South America | 1 | 32 | 11 | 4.46 |

# 1.วิเคราะห์พฤติกรรมผู้บริโภค (GROUPBY CUSTOMER ID) แต่ละทวีป



## สินค้าที่นิยม 10 อันดับแรกในแต่ละทวีป

```
# Group transactions by continent and item description
continent_item_counts = Data_new.groupby(['Continent', 'Description'])['CustomerID'].count().reset_index(name='CustomerCount')

# Sort by continent and transaction count in descending order to get the top 10 items for each continent
top_items_by_continent = continent_item_counts.groupby('Continent').apply(lambda x: x.nlargest(10, 'CustomerCount')).reset_index(drop=True)
top_items_by_continent
```

| Continent | Description | CustomerCount |
|---|---|---|
| Asia | Manual | 17 |
| Asia | CHARLOTTE BAG DOLLY GIRL DESIGN | 8 |
| Asia | RED SPOTTY BISCUIT TIN | 7 |
| Asia | REGENCY CAKESTAND 3 TIER | 7 |
| Asia | PARTY BUNTING | 6 |
| Asia | LADIES & GENTLEMEN METAL SIGN | 5 |
| Asia | LUNCH BAG DOLLY GIRL DESIGN | 5 |
| Asia | PACK OF 12 TRADITIONAL CRAYONS | 5 |
| Asia | PARTY PIZZA DISH RED RETROSPOT | 5 |
| Asia | RABBIT NIGHT LIGHT | 5 |
| Europe | WHITE HANGING HEART T-LIGHT HOLDER | 2065 |
| Europe | REGENCY CAKESTAND 3 TIER | 1885 |
| Europe | JUMBO BAG RED RETROSPOT | 1652 |
| Europe | ASSORTED COLOUR BIRD ORNAMENT | 1414 |
| Europe | PARTY BUNTING | 1401 |
| Europe | LUNCH BAG RED RETROSPOT | 1345 |
| Europe | SET OF 3 CAKE TINS PANTRY DESIGN | 1217 |
| Europe | POSTAGE | 1190 |
| Europe | LUNCH BAG BLACK SKULL. | 1121 |
| Europe | PACK OF 72 RETROSPOT CAKE CASES | 1073 |
| North America | CARD DOLLY GIRL | 4 |
| North America | SET OF 12 FAIRY CAKE BAKING CASES | 4 |
| North America | TEA PARTY BIRTHDAY CARD | 4 |
| North America | 60 CAKE CASES DOLLY GIRL DESIGN | 3 |
| North America | BAKING SET 9 PIECE RETROSPOT | 3 |
| North America | COLOURING PENCILS BROWN TUBE | 3 |
| North America | EMBROIDERED RIBBON REEL SUSIE | 3 |
| North America | PACK OF 60 SPACEBOY CAKE CASES | 3 |
| North America | PINK HAPPY BIRTHDAY BUNTING | 3 |
| North America | PLASTERS IN TIN SPACEBOY | 3 |

# 1.วิเคราะห์พฤติกรรมผู้บริโภค (GROUPBY CUSTOMER ID) แต่ละทวีป



## สินค้าที่นิยม 10 อันดับแรกในแต่ละทวีป

| | | |
|---|---|---|
| Oceania | SET OF 3 CAKE TINS PANTRY DESIGN | 10 |
| Oceania | LUNCH BAG RED RETROSPOT | 9 |
| Oceania | RED TOADSTOOL LED NIGHT LIGHT | 9 |
| Oceania | BAKING SET 9 PIECE RETROSPOT | 8 |
| Oceania | BAKING SET SPACEBOY DESIGN | 8 |
| Oceania | HANGING HEART JAR T-LIGHT HOLDER | 8 |
| Oceania | LUNCH BAG SPACEBOY DESIGN | 8 |
| Oceania | PAPER BUNTING RETROSPOT | 8 |
| Oceania | PARTY BUNTING | 8 |
| Oceania | ROSES REGENCY TEACUP AND SAUCER | 8 |

| | | |
|---|---|---|
| South America | CLOCK MAGNET MUM'S KITCHEN | 1 |
| South America | COOK WITH WINE METAL SIGN | 1 |
| South America | DOLLY GIRL LUNCH BOX | 1 |
| South America | DOORMAT AIRMAIL | 1 |
| South America | EDWARDIAN PARASOL BLACK | 1 |
| South America | EDWARDIAN PARASOL NATURAL | 1 |
| South America | EDWARDIAN PARASOL PINK | 1 |
| South America | EDWARDIAN PARASOL RED | 1 |
| South America | EMERGENCY FIRST AID TIN | 1 |
| South America | FIRST AID TIN | 1 |

| | | |
|---|---|---|
| South Africa | 4 TRADITIONAL SPINNING TOPS | 1 |
| South Africa | ALARM CLOCK BAKELIKE RED | 1 |
| South Africa | ASSORTED BOTTLE TOP MAGNETS | 1 |
| South Africa | BAKING SET 9 PIECE RETROSPOT | 1 |
| South Africa | BELLE JARDINIERE CUSHION COVER | 1 |
| South Africa | BIRDHOUSE GARDEN MARKER | 1 |
| South Africa | CARD HOLDER LOVE BIRD SMALL | 1 |
| South Africa | CHARLOTTE BAG VINTAGE ALPHABET | 1 |
| South Africa | CHILDRENS TOY COOKING UTENSIL SET | 1 |
| South Africa | CLASSIC GLASS COOKIE JAR | 1 |

# 1.วิเคราะห์พฤติกรรมผู้บริโภค (GROUPBY CUSTOMER ID) แต่ละทวีป



## ทวีป Europe

```
transactionsEurope = Europe_data.groupby('CustomerID')['StockCode'].apply(list)
min_sup = 0.075
frequentItemsetsEurope = list(apriori(transactionsEurope,min_support = min_sup))
for i in frequentItemsetsEurope:
    if i[0].__len__()>1:
        print('yes')
        print(i)
```

```
set(Data_new[(Data_new['StockCode']=='22910')]['Description'])
```

| | |
|---|---|
| 22910 | PAPER CHAIN KIT VINTAGE CHRISTMAS |
| 22086 | PAPER CHAIN KIT 50'S CHRISTMAS |

RelationRecord(items=frozenset({'22086', '22910'}), support=0.07504040063726622, ordered_statistics=[OrderedStatistic(items_base=frozenset(), items_add=frozenset({'22086', '22910'}), confidence=0.07504040063726622, lift=1.0), OrderedStatistic(items_base=frozenset({'22086'}), items_add=frozenset({'22910'}), confidence=0.5301794453507734, lift=4.916931858274152), OrderedStatistic(items_base=frozenset({'22910'}), items_add=frozenset({'22086'}), confidence=0.6959314775160599, lift=4.916931858274152)])

# 1.วิเคราะห์พฤติกรรมผู้บริโภค (GROUPBY CUSTOMER ID) แต่ละทวีป



## ทวีป Asia

RelationRecord(items=frozenset({'22630', '23240', '22629', '22423'}), support=0.15789473684210525, ordered_statistics=[OrderedStatistic(items_base=frozenset(), items_add=frozenset({'22630', '23240', '22629', '22423'}), confidence=0.15789473684210525, lift=1.0), OrderedStatistic(items_base=frozenset({'22423'}), items_add=frozenset({'23240', '22630', '22629'}), confidence=0.5, lift=3.166666666666667), OrderedStatistic(items_base=frozenset({'22629'}), items_add=frozenset({'23240', '22630', '22423'}), confidence=1.0, lift=6.3333333333333334), OrderedStatistic(items_base=frozenset({'22630'}), items_add=frozenset({'23240', '22629', '22423'}), confidence=1.0, lift=6.333333333333334), OrderedStatistic(items_base=frozenset({'23240'}), items_add=frozenset({'22630', '22629', '22423'}), confidence=0.6, lift=3.8000000000000003), OrderedStatistic(items_base=frozenset({'22629', '22423'}), items_add=frozenset({'23240', '22630'}), confidence=1.0, lift=6.333333333333334), OrderedStatistic(items_base=frozenset({'22630', '22423'}), items_add=frozenset({'23240', '22629'}), confidence=1.0, lift=6.333333333333334), OrderedStatistic(items_base=frozenset({'23240', '22423'}), items_add=frozenset({'22630', '22629'}), confidence=1.0, lift=6.333333333333334), OrderedStatistic(items_base=frozenset({'22629', '22630'}), items_add=frozenset({'23240', '22423'}), confidence=1.0, lift=6.333333333333334), OrderedStatistic(items_base=frozenset({'23240', '22629'}), items_add=frozenset({'22630', '22423'}), confidence=1.0, lift=6.333333333333334), OrderedStatistic(items_base=frozenset({'23240', '22630'}), items_add=frozenset({'22629', '22423'}), confidence=1.0, lift=6.333333333333334), OrderedStatistic(items_base=frozenset({'22630', '22629', '22423'}), items_add=frozenset({'23240'}), confidence=1.0, lift=3.8000000000000003), OrderedStatistic(items_base=frozenset({'23240', '22629', '22423'}), items_add=frozenset({'22630'}), confidence=1.0, lift=6.333333333333334), OrderedStatistic(items_base=frozenset({'23240', '22630', '22423'}), items_add=frozenset({'22629'}), confidence=1.0, lift=6.333333333333334), OrderedStatistic(items_base=frozenset({'23240', '22629', '22630'}), items_add=frozenset({'22423'}), confidence=1.0, lift=3.166666666666667)]) [ ]
set(Data_new[(Data_new['StockCode']=='22630')]['Description'])

| | |
|---|---|
| 22630 | DOLLY GIRL LUNCH BOX |
| 22629 | SPACEBOY LUNCH BOX |

| | |
|---|---|
| 22423 | REGENCY CAKESTAND 3 TIER, damages, faulty |
| 23240 | SET OF 4 KNICK KNACK TINS  DOILEY |

# 1.วิเคราะห์พฤติกรรมผู้บริโภค (GROUPBY CUSTOMER ID) แต่ละทวีป



## ทวีป Oceania

RelationRecord(items=frozenset({'22138', '22617'}), support=0.4444444444444444, ordered_statistics=[OrderedStatistic(items_base=frozenset(), items_add=frozenset({'22138', '22617'}), confidence=0.4444444444444444, lift=1.0), OrderedStatistic(items_base=frozenset({'22138'}), items_add=frozenset({'22617'}), confidence=1.0, lift=2.25), OrderedStatistic(items_base=frozenset({'22617'}), items_add=frozenset({'22138'}), confidence=1.0, lift=2.25)])

| | |
|---|---|
| 22617 | BAKING SET SPACEBOY DESIGN, mouldy, thrown away. |
| 22138 | BAKING SET 9 PIECE RETROSPOT |

# 1.วิเคราะห์พฤติกรรมผู้บริโภค (GROUPBY CUSTOMER ID) แต่ละทวีป



## ทวีป North America

RelationRecord(items=frozenset({'22138', '22619', '22551', '22649', '21232', '23159', '22951', '16161P', '22417'}), support=0.25, ordered_statistics= [OrderedStatistic(items_base=frozenset(), items_add=frozenset({'22138', '22619', '22551', '22649', '21232', '23159', '22951', '16161P', '22417'}), confidence=0.25, lift=1.0), OrderedStatistic(items_base=frozenset({'16161P'}), items_add=frozenset({'22138', '22619', '22551', '22649', '21232', '23159', '22951', '22417'}), confidence=1.0, lift=4.0),.....,

| | |
|---|---|
| 22417 | PACK OF 60 SPACEBOY CAKE CASES |
| 22649 | STRAWBERRY FAIRY CAKE TEAPOT |
| 22551 | PLASTERS IN TIN SPACEBOY |
| 16161P | WRAP ENGLISH ROSE |
| 22138 | BAKING SET 9 PIECE RETROSPOT |
| 23159 | SET OF 5 PANCAKE DAY MAGNETS |
| 22619 | SET OF 6 SOLDIER SKITTLES |
| 22951 | 60 CAKE CASES DOLLY GIRL DESIGN |
| 21232 | STRAWBERRY CERAMIC TRINKET BOX, STRAWBERRY CERAMIC TRINKET POT |

# 1.วิเคราะห์พฤติกรรมผู้บริโภค (GROUPBY CUSTOMER ID) แต่ละทวีป



## South America

| StockCode | PurchaseCount |
|---|---|
| 15056BL | 1 |
| 15056N | 1 |
| 23179 | 1 |
| 23178 | 1 |
| 23054 | 1 |
| 23053 | 1 |
| 23052 | 1 |
| 23051 | 1 |
| 23050 | 1 |
| 23049 | 1 |
| 22993 | 1 |
| 22722 | 1 |
| 22699 | 1 |
| 22698 | 1 |

## South Africa

| StockCode | PurchaseCount |
|---|---|
| 20676 | 1 |
| 23316 | 1 |
| 22915 | 1 |
| 22960 | 1 |
| 23081 | 1 |
| 23169 | 1 |
| 23201 | 1 |
| 23203 | 1 |
| 23205 | 1 |
| 23209 | 1 |
| 23240 | 1 |
| 23245 | 1 |
| 23284 | 1 |
| 23298 | 1 |

เนื่องจากทวีป South America และ South Africa มีลูกค้าแต่คนเดียว แม้จะมาซื้อสินค้าหลายครั้ง แต่ก็ไม่มีสินค้าใดซ้ำกันเลย จึงไม่สามารถสรุปพฤติกรรมผู้บริโภคของสองทวีปนี้ได้

# 2.ในทั้ง 7 ;วัน (MONDAY TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY SUNDAY) ของทวีปยุโรปของชนิดใดขายคู่กันดีที่สุดและอยู่ในวันใด



```python
# Convert 'InvoiceDate' to datetime objects
europe_data['InvoiceDate'] = pd.to_datetime(europe_data['InvoiceDate'])

# Extract the day of the week (0=Monday, 6=Sunday)
europe_data['DayOfWeek'] = europe_data['InvoiceDate'].dt.dayofweek

# Create a dictionary to map dayofweek to day names
day_names = {
    0: 'Monday', 1: 'Tuesday', 2: 'Wednesday', 3: 'Thursday',
    4: 'Friday', 5: 'Saturday', 6: 'Sunday'
}

# Map dayofweek to day names in the dataframe
europe_data['DayName'] = europe_data['DayOfWeek'].map(day_names)
```

| | StockCode |
|---|---|
| DayName | |
| Friday | [[84991, 21212, 22938, 21124, 84457, 22857, 21... |
| Monday | [[23480, 21265, 21636, 22372, 22375, 22371, 22... |
| Sunday | [[23077, 23078, POST], [22064, 21232, 22066, 2... |
| Thursday | [[22376, 22374, 22371, 22375, 20665, 23076, 21... |
| Tuesday | [[23166, 23166], [85116, 22375, 71477, 22492, ... |
| Wednesday | [[84625A, 84625C, 85116, 20719, 22375, 22376, ... |

```python
# Group by DayName and aggregate the items
day_items = customer_day_items.groupby('DayName')['StockCode'].apply(list)
```

# ของชนิดใดขายคู่กันดีที่สุดและอยู่ในวันใด



```
# Apply apriori
if transactions :
  frequent_itemsets = list(apriori(transactions, min_support=0.07))  # Adjust min_support as needed

  print(f"\nAssociation Rules for {day}:")
  for itemset in frequent_itemsets:
      if len(itemset[0]) > 1 :  # Print rules with more than one item
          print(itemset) # Indented this line to print the itemset when the condition is True
```

RelationRecord(items=frozenset({'82482', '82494L'}), support=0.07079646017699115, ordered_statistics=[OrderedStatistic(items_base=frozenset(), items_add=frozenset({'82482', '82494L'}), confidence=0.07079646017699115, lift=1.0), OrderedStatistic(items_base=frozenset({'82482'}), items_add=frozenset({'82494L'}), confidence=0.7272727272727273, lift=7.92982456140350 86), OrderedStatistic(items_base=frozenset({'82494L'}), items_add=frozenset({'82482'}), confidence=0.77192982456140 35, lift=7.92982456140350 86)])

# ของชนิดใดขายคู่กันดีที่สุดและอยู่ในวันใด



| | |
|---|---|
| 82494L | WOODEN FRAME ANTIQUE WHITE , cracked, crushed ctn , nan |
| 82482 | WOODEN PICTURE FRAME WHITE FINISH |

# THANK YOU

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