

In [2]:

```
!pip install apyori
```

Requirement already satisfied: apyori in c:\users\b sai dixita\anaconda3\lib\site-packages (1.1.2)

In [3]:

```
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
```

In [4]:

```
dataset=pd.read_csv("C:/Users/B SAI DIXITA/Downloads/Book2.csv")
```

In [5]:

```
dataset.head()
```

Out[5]:

	The Lord of the rings	Cinema Paradiso	Se7en	Avengers: Infinity War	The Shining	High and Low	Terminator 2: Judgment Day	Toy Story	City of God	Witness Prosecution
0	The Shawshank Redemption	Fight Club	Pulp Fiction	NaN	NaN	NaN	NaN	NaN	NaN	I
1	The Godfather	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	I
2	The Godfather: Part II	Se7en	NaN	NaN	NaN	NaN	NaN	NaN	NaN	I
3	The Dark Knight	The Intouchables	One Flew Over the Cuckoo's Nest	whole wheat Star Wars: Episode V - The Empire ...	Whiplash	NaN	NaN	NaN	NaN	I
4	12 Angry Men	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	I

In [ ]:

```
transactions=[]
for i in range(0,7466):
    transactions.append([str(dataset.values[i,j] )for j in range(0,20)])
```

In [15]:

```
from apyori import apriori
```

In [16]:

```
rules=apriori(transactions=transactions,min_support=0.003,min_confidence=0.003,min_l
```

In [17]:

```
results=list(rules)
```

```
In [18]: print(results)
```

```
[RelationRecord(items=frozenset({'Captain America', 'Black Panther'}), support=0.003348961821835231, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Black Panther'}), items_add=frozenset({'Captain America'}), confidence=0.0704225352112676, lift=5.153962993648163), OrderedStatistic(items_base=frozenset({'Captain America'}), items_add=frozenset({'Black Panther'}), confidence=0.2450980392156863, lift=5.153962993648164)]), RelationRecord(items=frozenset({'Seven Samurai', 'Black Panther'}), support=0.004018754186202277, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Black Panther'}), items_add=frozenset({'Seven Samurai'}), confidence=0.08450704225352111, lift=3.777515391751707), OrderedStatistic(items_base=frozenset({'Seven Samurai'}), items_add=frozenset({'Black Panther'}), confidence=0.17964071856287422, lift=3.7775153917517073)]), RelationRecord(items=frozenset({'Braveheart', 'Witness for the Prosecution'}), support=0.0042866711319490955, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Braveheart'}), items_add=frozenset({'Witness for the Prosecution'}), confidence=0.10031347962382445, lift=3.3281783350748864), OrderedStatistic(items_base=frozenset({'Witness for the Prosecution'}), items_add=frozenset({'Braveheart'}), confidence=0.1422222222222222, lift=3.3281783350748864)]), RelationRecord(items=frozenset({'Toy Story', 'Capernaum'}), support=0.0034829202947086403, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Capernaum'}), items_add=frozenset({'Toy Story'}), confidence=0.10276679841897234, lift=3.2506531788035105), OrderedStatistic(items_base=frozenset({'Toy Story'}), items_add=frozenset({'Capernaum'}), confidence=0.11016949152542373, lift=3.2506531788035105)]), RelationRecord(items=frozenset({'Game of thrones', 'Comedy nights with Kapil'}), support=0.003215003348961822, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Comedy nights with Kapil'}), items_add=frozenset({'Game of 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165, lift=3.4801864801864797), OrderedStatistic(items_base=frozenset({'The Lord of the
rings'}), items_add=frozenset({'Billa', 'Back to the Future'}), confidence=0.0429
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la', 'Back to the Future'}), items_add=frozenset({'The Lord of the rings'}), confide
nce=0.2555555555555554, lift=3.565835929387331), OrderedStatistic(items_base=frozen
set({'The Lord of the rings', 'Back to the Future'}), items_add=frozenset({'Bill
a'}), confidence=0.3333333333333333, lift=3.48018648018648)]), RelationRecord(items=
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redStatistic(items_base=frozenset({'The Intouchables', 'Back to the Future'}), items
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e Intouchables'}), confidence=0.07302231237322515, lift=3.079726338226699), OrderedS
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6), OrderedStatistic(items_base=frozenset({'Billa', 'Comedy nights with Kapil'}), it
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Rings: The Fellowship of the Ring', 'Comedy nights with Kapil'}), support=0.00576021
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e Ring'}), items_add=frozenset({'Comedy nights with Kapil'}), confidence=0.205741626
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et({'Billa', "Schindler's List"}), confidence=0.030959752321981424, lift=3.851909184
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s_add=frozenset({'The Intouchables'}), confidence=0.5, lift=3.8519091847265226), Ord
eredStatistic(items_base=frozenset({'Billa', 'The Intouchables'}), items_add=frozens
et({"Schindler's List"}), confidence=0.1694915254237288, lift=3.356112035247044)]),
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s'}), support=0.007233757535164099, ordered_statistics=[OrderedStatistic(items_base=
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({'Billa'}), confidence=0.3068181818181818, lift=3.203353464717101)]), RelationRecor
d(items=frozenset({'Billa', 'The Intouchables', 'The Lion King'}), support=0.0041527
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09524, lift=3.0824508824508827)]), RelationRecord(items=frozenset({'Billa', 'The Lor
d of the Rings: The Fellowship of the Ring', 'The Lion King'}), support=0.0066979236
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tionRecord(items=frozenset({'Billa', 'The Lion King', 'The Lord of the rings'}), sup
port=0.004018754186202277, ordered_statistics=[OrderedStatistic(items_base=frozenset

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et({'Braveheart'}), confidence=0.1336405529953917, lift=3.127356514453289)), RelationRecord(items=frozenset({'nan', 'Toy Story', 'Capernaum'}), support=0.003348961821835231, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Capernaum'}), items_add=frozenset({'nan', 'Toy Story'}), confidence=0.09881422924901186, lift=3.221171272243989), OrderedStatistic(items_base=frozenset({'Toy Story'}), items_add=frozenset({'nan', 'Capernaum'}), confidence=0.10593220338983052, lift=3.2542547255353282), OrderedStatistic(items_base=frozenset({'nan', 'Capernaum'}), items_add=frozenset({'Toy Story'}), confidence=0.10288065843621398, lift=3.254254725535328), OrderedStatistic(items_base=frozenset({'nan', 'Toy Story'}), items_add=frozenset({'Capernaum'}), confidence=0.1091703056768559, lift=3.221171272243989)]), RelationRecord(items=frozenset({'Casablanca', 'The Intouchables', 'The Shawshank Redemption'}), support=0.003750837240455459, ordered_statistics=[OrderedStatistic(items_base=frozenset({'The Shawshank Redemption'}), items_add=frozenset({'Casablanca', 'The Intouchables'}), confidence=0.042879019908116385, lift=3.2009188361408882), OrderedStatistic(items_base=frozenset({'Casablanca', 'The Intouchables'}), items_add=frozenset({'The Shawshank Redemption'}), confidence=0.28, lift=3.2009188361408887)]), RelationRecord(items=frozenset({'The Dark Knight', 'Kanan Gill Comedy', 'Comedy nights with Kapil'}), support=0.003884795713328868, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Comedy nights with Kapil'}), items_add=frozenset({'The Dark Knight', 'Kanan Gill Comedy'}), confidence=0.05882352941176471, lift=6.098856209150328), OrderedStatistic(items_base=frozenset({'Kanan Gill Comedy'}), items_add=frozenset({'The Dark Knight', 'Comedy nights with Kapil'}), confidence=0.13122171945701358, lift=4.75519483372139), OrderedStatistic(items_base=frozenset({'The Dark Knight', 'Comedy nights with Kapil'}), 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Intouchables'}), confidence=0.5, lift=3.8519091847265226), OrderedStatistic(items_base=frozenset({'The Intouchables', 'Comedy nights with Kapil'}), items_add=frozenset({'Prison Break'}), confidence=0.21093750000000003, lift=3.507012110244989), OrderedStatistic(items_base=frozenset({'The Intouchables', 'Prison Break'}), items_add=frozenset({'Comedy nights with Kapil'}), confidence=0.24324324324324323, lift=3.683186228825174)]), RelationRecord(items=frozenset({'Prison Break', 'The Lord of the Rings: The Fellowship of the Ring', 'Comedy nights with Kapil'}), support=0.0034829202947086403, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Comedy nights with Kapil'}), items_add=frozenset({'The Lord of the Rings: The Fellowship of the Ring', 'Prison Break'}), confidence=0.05273833671399594, lift=3.051873516046354), OrderedStatistic(items_base=frozenset({'The Lord of the Rings: The Fellowship of the Ring', 'Prison Break'}), items_add=frozenset({'Comedy nights with Kapil'}), 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with Kapil'}), confidence=0.22674418604651161, lift=3.4333577055521487)]), RelationRecord(items=frozenset({'The Intouchables', 'Schindler's List', 'Comedy nights with Kapil'}), support=0.0036168787675820496, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Comedy nights with Kapil'}), items_add=frozenset({'The Intouchables', 'Schindler's List'}), confidence=0.05476673427991886, lift=3.586260275435038), OrderedStatistic(items_base=frozenset({'Schindler's List'}), items_add=frozenset({'The Intouchables', 'Comedy nights with Kapil'}), confidence=0.07161803713527852, lift=4.176786306366048), OrderedStatistic(items_base=frozenset({'The Intouchables'}), items_add=frozenset({'Schindler's List', 'Comedy nights with Kapil'}), confidence=0.027863777089783284, lift=3.104523820525854), OrderedStatistic(items_base=frozenset({'Schindler's List', 'Comedy nights with Kapil'}), items_add=frozenset({'The Intouchables'}), confidence=0.40298507462686567, lift=3.104523820525854), OrderedStatistic(items_base=frozenset({'The Intouchables', 'Comedy nights with Kapil'}), items_add=frozenset({'Schindler's List'}), confidence=0.21093750000000003, lift=4.176786306366049), OrderedStatistic(items_base=frozenset({'The Intouchables', 'Schindler's List'}), items_add=frozenset({'Comedy nights with Kapil'}), confidence=0.2368421052631579, lift=3.586260275435038)]), RelationRecord(items=frozenset({'The Intouchables', 'The Lord of the Rings: The Fellowship of the Ring', 'Comedy nights with Kapil'}), support=0.007233757535164099, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Comedy nights with Kapil'}), items_add=frozenset({'The Intouchables', 'The Lord of the Rings: The Fellowship of the Ring'}), confidence=0.10953346855983773, lift=3.0739373789443185), OrderedStatistic(items_base=frozenset({'The Intouchables', 'The Lord of the Rings: The Fellowship of the Ring'}), items_add=frozenset({'Comedy nights with Kapil'}), confidence=0.2030075187969925, lift=3.0739373789443185)]), RelationRecord(items=frozenset({'The Intouchables', 'The Lord of the rings', 'Comedy nights with Kapil'}), support=0.003215003348961822, ordered_statistics=[OrderedStatistic(items_base=frozenset({'The Intouchables'}), items_add=frozenset({'The Lord of the rings', 'Comedy nights with Kapil'}), confidence=0.02476780185758514, lift=3.0815273477812184), OrderedStatistic(items_base=frozenset({'The Lord of the rings', 'Comedy nights with Kapil'}), items_add=frozenset({'The Intouchables'}), confidence=0.4, lift=3.0815273477812184)]), RelationRecord(items=frozenset({'The Intouchables', 'inception', 'Comedy nights with Kapil'}), support=0.004956463496316142, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Comedy nights with Kapil'}), items_add=frozenset({'The Intouchables', 'inception'}), confidence=0.07505070993914807, lift=3.395476058762063), OrderedStatistic(items_base=frozenset({'The Intouchables', 'inception'}), items_add=frozenset({'Comedy nights with Kapil'}), confidence=0.22424242424242427, lift=3.395476058762063)]), RelationRecord(items=frozenset({'The Lord of the Rings: The Fellowship of the Ring', 'The Lion King', 'Comedy nights with Kapil'}), support=0.004420629604822505, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Comedy nights with Kapil'}), items_add=frozenset({'The Lord of the Rings: The Fellowship of the Ring', 'The Lion King'}), confidence=0.06693711967545639, lift=3.182710817689694), OrderedStatistic(items_base=frozenset({'The Lord of the Rings: The Fellowship of the Ring'}), items_add=frozenset({'The Lion King', 'Comedy nights with Kapil'}), confidence=0.02528735632183908, lift=3.4957428693060875), OrderedStatistic(items_base=frozenset({'The Lion King', 'Comedy nights with Kapil'}), items_add=frozenset({'The Lord of the Rings: The Fellowship of the Ring'}), confidence=0.6111111111111112, lift=3.495742869306088), OrderedStatistic(items_base=frozenset({'The Lord of the Rings: The Fellowship of the Ring', 'The Lion King'}), items_add=frozenset({'Comedy nights with Kapil'}), confidence=0.21019108280254778, lift=3.1827108176896943)]), RelationRecord(items=frozenset({'nan', 'Game of thrones', 'Prision Break'}), support=0.003884795713328868, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Game of thrones'}), items_add=frozenset({'nan', 'Prision Break'}), confidence=0.24786324786324784, lift=4.323128844156881), OrderedStatistic(items_base=frozenset({'Prision Break'}), items_add=frozenset({'nan', 'Game of thrones'}), confidence=0.0645879732739421, lift=4.46434463416646), OrderedStatistic(items_base=frozenset({'nan', 'Game of thrones'}), items_add=frozenset({'Prision Break'}), confidence=0.26851851851851855, lift=4.46434463416646), OrderedStatistic(items_base=frozenset({'nan', 'Prision Break'}), items_add=frozenset({'Game of thrones'}), confidence=0.06775700934579439, lift=4.323128844156881)]), RelationRecord(items=frozenset({'The Dark Knight', 'The Lord of the Rings: The Fellowship of the Ring', 'Game of thrones'}), support=0.003215003348961822, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Game of thrones'}), items_add=frozenset({'The Lord of the Rings: The Fellowship of the Ring', 'The Dark Knight'}), confidence=0.2051282051282051, lift=3.425686915619801), OrderedStatistic(items_base=frozenset({'The Lord of the Rings: The Fellowship of the Ring', 'The Dark Knight'}), items_add=frozenset({'Game of thrones'}), confidence=0.053691275167785234, lift=3.425686915619801)]), RelationRecord(items=frozenset({'inception', 'The Lord of the Rings: The Fellowship of the Ring', 'Gladiator'}), support=0.003348961821835231, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Gladiator'}), items_add=frozenset({'inception', 'The Lord of the Rings: The Fellowship of the Ring'}), c

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onfidence=0.1256281407035176, lift=3.189843776706663), OrderedStatistic(items_base=frozenset({'inception'}), items_add=frozenset({'The Lord of the Rings: The Fellowship of the Ring', 'Gladiator'}), confidence=0.033967391304347824, lift=3.4265753525264393), OrderedStatistic(items_base=frozenset({'The Lord of the Rings: The Fellowship of the Ring', 'Gladiator'}), items_add=frozenset({'inception'}), confidence=0.33783783783783783, lift=3.4265753525264393), OrderedStatistic(items_base=frozenset({'inception', 'The Lord of the Rings: The Fellowship of the Ring'}), items_add=frozenset({'Gladiator'}), confidence=0.08503401360544217, lift=3.1898437767066627)], RelationRecord(items=frozenset({'nan', 'Harry Potter 1', 'Harry Potter 2'}), support=0.005760214333556598, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Harry Potter 1'}), items_add=frozenset({'nan', 'Harry Potter 2'}), confidence=0.3675213675213675, lift=4.738423158112277), OrderedStatistic(items_base=frozenset({'Harry Potter 2'}), items_add=frozenset({'nan', 'Harry Potter 1'}), confidence=0.07300509337860782, lift=4.698129500614718), OrderedStatistic(items_base=frozenset({'nan', 'Harry Potter 1'}), items_add=frozenset({'Harry Potter 2'}), confidence=0.3706896551724138, lift=4.698129500614718), OrderedStatistic(items_base=frozenset({'nan', 'Harry Potter 2'}), items_add=frozenset({'Harry Potter 1'}), confidence=0.07426597582037997, lift=4.738423158112277)], RelationRecord(items=frozenset({'nan', 'Harry Potter 1', 'The Lord of the rings'}), support=0.005090421969189551, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Harry Potter 1'}), items_add=frozenset({'nan', 'The Lord of the rings'}), confidence=0.32478632478632474, lift=4.753980224568458), OrderedStatistic(items_base=frozenset({'The Lord of the rings'}), items_add=frozenset({'nan', 'Harry Potter 1'}), confidence=0.07102803738317758, lift=4.570899129874316), OrderedStatistic(items_base=frozenset({'nan', 'Harry Potter 1'}), items_add=frozenset({'The Lord of the rings'}), confidence=0.3275862068965517, lift=4.570899129874316), OrderedStatistic(items_base=frozenset({'nan', 'The Lord of the rings'}), items_add=frozenset({'Harry Potter 1'}), confidence=0.07450980392156861, lift=4.753980224568458)], RelationRecord(items=frozenset({'nan', 'crimes of grindelwald', 'Harry Potter 2'}), support=0.005492297387809779, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Harry Potter 2'}), items_add=frozenset({'nan', 'crimes of grindelwald'}), confidence=0.06960950764006792, lift=3.8208454009787283), OrderedStatistic(items_base=frozenset({'crimes of grindelwald'}), items_add=frozenset({'nan', 'Harry Potter 2'}), confidence=0.29078014184397166, lift=3.749004764879531), OrderedStatistic(items_base=frozenset({'nan', 'Harry Potter 2'}), items_add=frozenset({'crimes of grindelwald'}), confidence=0.07081174438687392, lift=3.7490047648795306), OrderedStatistic(items_base=frozenset({'nan', 'crimes of grindelwald'}), items_add=frozenset({'Harry Potter 2'}), confidence=0.30147058823529416, lift=3.8208454009787283)], RelationRecord(items=frozenset({'It's a Wonderful Life', 'The Lord of the Rings: The Fellowship of the Ring', 'Interstellar'}), support=0.0030810448760884125, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Interstellar'}), items_add=frozenset({'The Lord of the Rings: The Fellowship of the Ring', 'It's a Wonderful Life'}), confidence=0.06216216216216216, lift=3.7422624237140365), OrderedStatistic(items_base=frozenset({'It's a Wonderful Life'}), items_add=frozenset({'The Lord of the Rings: The Fellowship of the Ring', 'Interstellar'}), confidence=0.058524173027989825, lift=3.581007800442164), OrderedStatistic(items_base=frozenset({'The Lord of the Rings: The Fellowship of the Ring', 'Interstellar'}), items_add=frozenset({'It's a Wonderful Life'}), confidence=0.1885245901639344, lift=3.581007800442164), OrderedStatistic(items_base=frozenset({'The Lord of the Rings: The 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Knight', 'Interstellar'}), support=0.006697923643670462, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Interstellar'}), items_add=frozenset({'inception', 'The Dark Knight'}), confidence=0.13513513513513514, lift=3.285940663790827), OrderedStatistic(items_base=frozenset({'inception', 'The Dark Knight'}), items_add=frozenset({'Interstellar'}), confidence=0.06793478260869565, lift=3.961977751358696), OrderedStatistic(items_base=frozenset({'The Dark Knight', 'Interstellar'}), items_add=frozenset({'inception'}), confidence=0.39062500000000006, lift=3.9619777513586962), OrderedStatistic(items_base=frozenset({'inception', 'The Dark Knight'}), items_add=frozenset({'Interstellar'}), confidence=0.16286644951140064, lift=3.2859406637908264)], RelationRecord(items=frozenset({'The Into

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uchables', 'inception', 'Interstellar'})), support=0.0036168787675820496, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Interstellar'}), items_add=frozenset({'The Intouchables', 'inception'}), confidence=0.07297297297297298, lift=3.301474201474202), OrderedStatistic(items_base=frozenset({'inception'}), items_add=frozenset({'The Intouchables', 'Interstellar'}), confidence=0.036684782608695655, lift=3.968868147448015), OrderedStatistic(items_base=frozenset({'The Intouchables', 'Interstellar'}), items_add=frozenset({'inception'}), confidence=0.3913043478260869, lift=3.9688681474480147), OrderedStatistic(items_base=frozenset({'The Intouchables', 'inception'}), items_add=frozenset({'Interstellar'}), confidence=0.16363636363636364, lift=3.301474201474201)], RelationRecord(items=frozenset({'inception', 'The Lord of the Rings: The Fellowship of the Ring', 'Interstellar'}), support=0.006430006697923644, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Interstellar'}), items_add=frozenset({'inception', 'The Lord of the Rings: The Fellowship of the Ring'}), confidence=0.12972972972972974, lift=3.293987865416437), OrderedStatistic(items_base=frozenset({'inception'}), items_add=frozenset({'The Lord of the Rings: The Fellowship of the Ring', 'Interstellar'}), confidence=0.06521739130434782, lift=3.9905559515324303), OrderedStatistic(items_base=frozenset({'The Lord of the Rings: The Fellowship of the Ring', 'Interstellar'}), items_add=frozenset({'inception'}), confidence=0.39344262295081966, lift=3.9905559515324307), OrderedStatistic(items_base=frozenset({'inception', 'The Lord of the Rings: The Fellowship of the Ring'}), items_add=frozenset({'Interstellar'}), confidence=0.163265306122449, lift=3.293987865416437)], RelationRecord(items=frozenset({'inception', 'The Lord of the Rings: The Return of the King', 'Interstellar'}), support=0.003215003348961822, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Interstellar'}), items_add=frozenset({'inception', 'The Lord of the Rings: The Return of the King'}), confidence=0.06486486486486487, lift=4.701128312778798), OrderedStatistic(items_base=frozenset({'inception'}), items_add=frozenset({'The Lord of the Rings: The Return of the King', 'Interstellar'}), confidence=0.03260869565217391, lift=4.681229096989966), OrderedStatistic(items_base=frozenset({'The Lord of the Rings: The Return of the King', 'Interstellar'}), items_add=frozenset({'inception'}), confidence=0.4615384615384615, lift=4.681229096989966), OrderedStatistic(items_base=frozenset({'inception', 'The Lord of the Rings: The Return of the King'}), items_add=frozenset({'Interstellar'}), confidence=0.23300970873786406, lift=4.701128312778797)], RelationRecord(items=frozenset({'inception', 'The Silence of the Lambs', 'Interstellar'}), support=0.004018754186202277, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Interstellar'}), items_add=frozenset({'inception', 'The Silence of the Lambs'}), confidence=0.08108108108108107, lift=3.498672082487111), OrderedStatistic(items_base=frozenset({'inception'}), items_add=frozenset({'The Silence of the Lambs', 'Interstellar'}), confidence=0.040760869565217385, lift=4.474704283887467), OrderedStatistic(items_base=frozenset({'The Silence of the Lambs', 'Interstellar'}), items_add=frozenset({'inception'}), confidence=0.4411764705882353, lift=4.474704283887468), OrderedStatistic(items_base=frozenset({'inception', 'The Silence of the Lambs'}), items_add=frozenset({'Interstellar'}), confidence=0.17341040462427745, lift=3.4986720824871114)], RelationRecord(items=frozenset({'inception', 'nan', 'Interstellar'}), support=0.014199598124581379, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Interstellar'}), items_add=frozenset({'inception', 'nan'}), confidence=0.28648648648648645, lift=3.0292090957813333), OrderedStatistic(items_base=frozenset({'inception'}), items_add=frozenset({'nan', 'Interstellar'}), confidence=0.14402173913043478, lift=3.080579606328641), OrderedStatistic(items_base=frozenset({'nan', 'Interstellar'}), items_add=frozenset({'inception'}), confidence=0.3037249283667621, lift=3.0805796063286404), OrderedStatistic(items_base=frozenset({'inception', 'nan'}), items_add=frozenset({'Interstellar'}), confidence=0.15014164305949007, lift=3.0292090957813333)], RelationRecord(items=frozenset({'inception', 'The Lord of the Rings: The Fellowship of the Ring', 'It's a Wonderful Life'}), support=0.0053583389149363695, ordered_statistics=[OrderedStatistic(items_base=frozenset({'inception'}), items_add=frozenset({'The Lord of the Rings: The Fellowship of the Ring', 'It's a Wonderful Life'}), confidence=0.05434782608695652, lift=3.2718267882187937), OrderedStatistic(items_base=frozenset({'The Lord of the Rings: The Fellowship of the Ring', 'It's a Wonderful Life'}), items_add=frozenset({'inception'}), confidence=0.3225806451612903, lift=3.2718267882187937)], 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e Intouchables', 'The Lord of the Rings: The Fellowship of the Ring'})), items_add=frozenset({'Kanan Gill Comedy'}), confidence=0.11278195488721804, lift=3.8095805123668898)), RelationRecord(items=frozenset({'Once Upon a Time in America', 'inception', 'The Lord of the Rings: The Fellowship of the Ring'}), support=0.0030810448760884125, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Once Upon a Time in America'}), items_add=frozenset({'inception', 'The Lord of the Rings: The Fellowship of the Ring'}), confidence=0.12041884816753927, lift=3.057573814866261), OrderedStatistic(items_base=frozenset({'The Lord of the Rings: The Fellowship of the Ring'}), items_add=frozenset({'Once Upon a Time in America', 'inception'}), confidence=0.017624521072796932, lift=3.8696191120126207), OrderedStatistic(items_base=frozenset({'inception'}), items_add=frozenset({'Once Upon a Time in America', 'The Lord of the Rings: The Fellowship of the Ring'}), confidence=0.03125, 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OrderedStatistic(items_base=frozenset({'The Intouchables', 'The Pianist'}), items_add=frozenset({'Prison Break'}), confidence=0.1869918699186992, lift=3.108896011009108)]), RelationRecord(items=frozenset({'The Intouchables', 'inception', 'Prison Break'}), support=0.003884795713328868, ordered_statistics=[OrderedStatistic(items_base=frozenset({'The Intouchables'}), items_add=frozenset({'inception', 'Prison Break'}), confidence=0.02992776057791538, lift=3.1466300382273), OrderedStatistic(items_base=frozenset({'inception', 'Prison Break'}), items_add=frozenset({'The Intouchables'}), confidence=0.4084507042253521, lift=3.1466300382273)]), RelationRecord(items=frozenset({'The Lord of the Rings: The Two Towers', 'The Lord of the Rings: The Fellowship of the Ring', 'Pulp Fiction'}), support=0.003750837240455459, ordered_statistics=[OrderedStatistic(items_base=frozenset({'The Lord of the Rings: The Fellowship of the Ring'}), items_add=frozenset({'The Lord of the Rings: The Two Towers', 'Pulp Fiction'}), confidence=0.021455938697318006, lift=3.02204872406564), OrderedStatistic(items_base=frozenset({'The Lord of the Rings: The Two Towers'}), items_add=frozenset({'The Lord of the Rings: The Fellowship of the Ring', 'Pulp Fiction'}), confidence=0.13270142180094788, lift=3.6286304532750036), OrderedStatistic(items_base=frozenset({'The Lord of the Rings: The Fellowship of the Ring', 'Pulp Fiction'}), items_add=frozenset({'The Lord of the Rings: The Two Towers'}), confidence=0.10256410256410257, lift=3.6286304532750036), OrderedStatistic(items_base=frozenset({'The Lord of the Rings: The Two Towers', 'Pulp Fiction'}), items_add=frozenset({'The Lord of the Rings: The Fellowship of the Ring'}), confidence=0.5283018867924528, lift=3.0220487240656397)]), RelationRecord(items=frozenset({'The Intouchables', 'Schindler's List', 'The Dark Knight'}), support=0.008573342263898191, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Schindler's List'}), items_add=frozenset({'The Intouchables', 'The Dark Knight'}), confidence=0.16976127320954906, lift=3.529994162978506), OrderedStatistic(items_base=frozenset({'The Intouchables', 'The Dark Knight'}), items_add=frozenset({'Schindler's List'}), confidence=0.17827298050139273, lift=3.529994162978506)]), RelationRecord(items=frozenset({'Schindler's List', 'The Dark Knight', 'The Lion King'}), support=0.003750837240455459, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Schindler's List'}), items_add=frozenset({'The Dark Knight', 'The Lion King'}), confidence=0.0742705570291772, lift=3.029670536736676), OrderedStatistic(items_base=frozenset({'The Dark Knight', 'The Lion King'}), items_add=frozenset({'Schindler's List'}), confidence=0.15300546448087432, lift=3.029670536736676)]), RelationRecord(items=frozenset({'The Intouchables', 'Schindler's List', 'The Lion King'}), support=0.0030810448760884125, ordered_statistics=[OrderedStatistic(items_base=frozenset({'Schindler's List'}), items_add=frozenset({'The Intouchables', 'The Lion King'}), confidence=0.0610079575596817, lift=4.337375268409751), OrderedStatistic(items_base=frozenset({'The Intouchables'}), items_add=frozenset({'Schindler's List', 'The Lion King'}), confidence=0.023735810113519093, lift=3.4074581249503852), OrderedStatistic(items_base=frozenset({'Schindler's List', 'The Lion King'}), items_add=frozenset({'The Intouchables'}), confidence=0.4423076923076923, lift=3.4074581249503852), OrderedStatistic(items_base=frozenset({'The Intouchables', 'The Lion King'}), items_add=frozenset({'Schindler's List'}), confidence=0.21904761904761905, lift=4.337375268409751)]), RelationRecord(items=frozenset({'The Intouchables', 'The Silence of the Lambs', 'Schindler's List'}), support=0.004018754186202277, ordered_statistics=[OrderedStatistic(items_base=frozenset({'T

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he Intouchables'}), items_add=frozenset({'The Silence of the Lambs', "Schindler's Li
st"}), confidence=0.030959752321981424, lift=3.0409809353104125), OrderedStatistic(i
tems_base=frozenset({'The Silence of the Lambs', "Schindler's List"}), items_add=fro
zenset({'The Intouchables'}), confidence=0.39473684210526316, lift=3.040980935310412
5)), RelationRecord(items=frozenset({'The Intouchables', 'inception', "Schindler's
List"}), support=0.004018754186202277, ordered_statistics=[OrderedStatistic(items_ba
se=frozenset({"Schindler's List"}), items_add=frozenset({'The Intouchables', 'incept
ion'}), confidence=0.07957559681697612, lift=3.600192910537738), OrderedStatistic(it
ems_base=frozenset({'The Intouchables'}), items_add=frozenset({'inception', "Schindl
er's List"}), confidence=0.030959752321981424, lift=3.165952754569744), OrderedStati
stic(items_base=frozenset({'inception', "Schindler's List"}), items_add=frozenset
({'The Intouchables'}), confidence=0.41095890410958896, lift=3.165952754569744), Ord
eredStatistic(items_base=frozenset({'The Intouchables', 'inception'}), items_add=fro
zenset({"Schindler's List"}), confidence=0.18181818181818182, lift=3.600192910537738
4)), RelationRecord(items=frozenset({'The Intouchables', 'The Lord of the Rings: Th
e Fellowship of the Ring', 'Se7en'}), support=0.003348961821835231, ordered_statisti
cs=[OrderedStatistic(items_base=frozenset({'The Intouchables'}), items_add=frozenset
({'The Lord of the Rings: The Fellowship of the Ring', 'Se7en'}), confidence=0.02579
979360165119, lift=3.2099243206054355), OrderedStatistic(items_base=frozenset({'The
Lord of the Rings: The Fellowship of the Ring', 'Se7en'}), items_add=frozenset({'The
Intouchables'}), confidence=0.4166666666666667, lift=3.2099243206054355)]), Relation
Record(items=frozenset({'inception', 'The Departed', 'The Lord of the Rings: The Fel
lowship of the Ring'}), support=0.0048225050234427325, ordered_statistics=[OrderedSt
atistic(items_base=frozenset({'The Lord of the Rings: The Fellowship of the Ring'}),
items_add=frozenset({'inception', 'The Departed'}), confidence=0.02758620689655172,
lift=3.268746579091406), OrderedStatistic(items_base=frozenset({'inception'}), items
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g'}), confidence=0.048913043478260865, lift=3.068368651808549), OrderedStatistic(ite
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8, lift=5.50940187395713), OrderedStatistic(items_base=frozenset({'inception', 'The
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Towers'}), confidence=0.10505836575875487, lift=3.7168753572943367), OrderedStatistic(
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les', 'The Lord of the Rings: The Fellowship of the Ring'}), confidence=0.1306818181
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eredStatistic(items_base=frozenset({'The Silence of the Lambs', 'nan', 'The Lord of
the rings'}), items_add=frozenset({'The Lord of the Rings: The Fellowship of the Ri
ng', 'The Dark Knight'}), confidence=0.18399999999999997, lift=3.072841163310961
6)))]
```

In [23]:

```
def inspect(results):
    movie_1=[tuple(result[2][0][0])[0] for result in results]
    movie_2=[tuple(result[2][0][1])[0] for result in results]
    supports=[result[1] for result in results]
    return list(zip(movie_1,movie_2,supports))
resultsindataframe=pd.DataFrame(inspect(results),columns=['movie_1','movie_2','Suppo
```

In [24]:

```
print(resultsindataframe)
```

```

                                movie_1 \
0                                Black Panther
1                                Black Panther
2                                Braveheart
3                                Capernaum
4                                Comedy nights with Kapil
..                                ...
130                               Billa
131                                Comedy nights with Kapil
132                               inception
133                               inception
134  The Lord of the Rings: The Fellowship of the Ring

                                movie_2  Support
0                                Captain America  0.003349
1                                Seven Samurai  0.004019
2    Witness for the Prosecution  0.004287
3                                Toy Story  0.003483
4                                Game of thrones  0.003215
..                                ...      ...
```

```
130          inception  0.003081
131  The Silence of the Lambs  0.003081
132          nan  0.003349
133  The Silence of the Lambs  0.003885
134  The Silence of the Lambs  0.003081
```

[135 rows x 3 columns]

In [25]:

resultsindataframe.nlargest(n=10,columns='Support')

Out[25]:

	movie_1	movie_2	Support
10	Interstellar	inception	0.015941
53	Interstellar	inception	0.014200
23	inception	Billa	0.008707
60	Schindler's List	The Intouchables	0.008573
5	Comedy nights with Kapil	Kanan Gill Comedy	0.008038
31	Comedy nights with Kapil	nan	0.007502
115	Schindler's List	The Intouchables	0.007502
93	inception	Billa	0.007368
17	Billa	The Dark Knight	0.007234
36	Comedy nights with Kapil	The Intouchables	0.007234

In [ ]: