Foundations of Data Analysis
Unsupervised Learning Lab Assignment

Task -3 Apriori Algorithm for Recommender Systems

Due to my bad programming skills, I used a solution that I found online on GitHub:

https://gist.github.com/erickrribeiro/d1bf30eac5e23e9765592419a342616e

This solution provides the perfect results to the problem set and was adjusted to meet the export requirements of the assignment.

The results can be found in the root folder of the assignment.

c. Recommending a book

In this part of task 3 a recommendation should be made. A Person likes the books "Harry Potter and the Sorcerer's Stone (Book 1)" and "Harry Potter and the Chamber of Secrets (Book 2)".

Given those two books we need to calculate:

$$\mathrm{conf}(X \Rightarrow Y) = \frac{\mathrm{supp}(X \cup Y)}{\mathrm{supp}(X)}$$

Where X represents the support of the two books above and Y represents the recommendation.

In the patterns text, we can find that the support of X is 163.

Searching for the support of an additional book gives:

113:Harry Potter and the Chamber of Secrets (Book 2);Harry Potter and the Prisoner of Azkaban (Book 3);Harry Potter and the Sorcerers Stone (Book 1)

Confidence = 113/163 = 0,69

58:Harry Potter and the Chamber of Secrets (Book 2);Harry Potter and the Sorcerers Stone (Book 1);Harry Potter and the Order of the Phoenix (Book 5)

Confidence = 58/163 = 0,36

100:Harry Potter and the Chamber of Secrets (Book 2);Harry Potter and the Sorcerers Stone (Book 1);Harry Potter and the Goblet of Fire (Book 4)

Confidence = 100/163 = 0,61

23:Harry Potter and the Chamber of Secrets (Book 2);The Fellowship of the Ring (The Lord of the Rings, Part 1);Harry Potter and the Sorcerers Stone (Book 1)

Confidence = 23/163 = 0,14

Therefore I would recommend : Harry Potter and the Prisoner of Azkaban (Book 3) with 69% confidence.

Further recommendations?

Secondly I would recommend Harry Potter and the Goblet of Fire (Book 4) with 61% confidence.

And at third place: Harry Potter and the Order of the Phoenix (Book 5) with 36% confidence.

But before I would recommend The Fellowship of the Ring (The Lord of the Rings, Part 1), I would rather recommend more than one book of Harry Potter.

Recommending two books:

91:Harry Potter and the Chamber of Secrets (Book 2);Harry Potter and the Prisoner of Azkaban (Book 3);Harry Potter and the Goblet of Fire (Book 4);Harry Potter and the Sorcerers Stone (Book 1)

55:Harry Potter and the Chamber of Secrets (Book 2);Harry Potter and the Prisoner of Azkaban (Book 3);Harry Potter and the Order of the Phoenix (Book 5);Harry Potter and the Sorcerers Stone (Book 1)

52:Harry Potter and the Chamber of Secrets (Book 2);Harry Potter and the Goblet of Fire (Book 4);Harry Potter and the Order of the Phoenix (Book 5);Harry Potter and the Sorcerers Stone (Book 1)

Recommendation: Harry Potter and the Prisoner of Azkaban (Book 3);Harry Potter and the Order of the Phoenix (Book 5) with 33% confidence.

Recommending three books:

50:Harry Potter and the Goblet of Fire (Book 4);Harry Potter and the Order of the Phoenix (Book 5);Harry Potter and the Sorcerers Stone (Book 1);Harry Potter and the Chamber of Secrets (Book 2);Harry Potter and the Prisoner of Azkaban (Book 3)

Recommendation: Harry Potter and the Goblet of Fire (Book 4);Harry Potter and the Order of the Phoenix (Book 5); Harry Potter and the Prisoner of Azkaban (Book 3) with 31% confidence.