ASSOCIATION RULE MINIG

APRIORI

Apriori

- Association Rule Mining
- Transitive relations

- SUPPORT
- CONFIDENCE
- LIFT

Apriori

- MILK > BREAD
- MILK > EGGS
- MILK > BREAD > EGGS

"People who do this also do this!"

Apriori

SUPPORT

Market Basket Optimisation: $$\text{support}(I) = \frac{\#\text{ transactions containing } I}{\#\text{ transactions}}$$

Movie Recommendation: $$\text{support}(M) = \frac{\#\text{ user watchlists containing } M}{\#\text{ user watchlists}}$$

Apriori

SUPPORT

- How many people have seen X-Machina
  - A: 10 / 100
  - Support = 10%

SIMPLE!!

Apriori

CONFIDENCE

Market Basket Optimisation: $$\text{confidence}(I_1 \rightarrow I_2) = \frac{\#\text{ transactions containing } I_1 \text{ and } I_2}{\#\text{ transactions containing } I_1}$$

Movie Recommendation: $$\text{confidence}(M_1 \rightarrow M_2) = \frac{\#\text{ user watchlists containing } M_1 \text{ and } M_2}{\#\text{ user watchlists containing } M_1}$$

Apriori

CONFIDENCE

- People who have Watched **Interstellar**, are likely to like Ex-Machine as well
  - A: 40 watched **Interstellar**
  - out of 40, only 7 watched Ex-Machina

  - Confidence = 7 / 40 = 17.5%

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LIFT

Market Basket Optimisation:

$$\text{lift}(I_1 \rightarrow I_2) = \frac{\text{confidence}(I_1 \rightarrow I_2)}{\text{support}(I_2)}$$

Movie Recommendation:

$$\text{lift}(M_1 \rightarrow M_2) = \frac{\text{confidence}(M_1 \rightarrow M_2)}{\text{support}(M_2)}$$

Apriori

LIFT

- People who watched
  - Interstellar 40 / 100
  - Ex-Machina 07 / 40

- What is the Likely hood if we recommend Ex-machina to person who has watched Interstellar?

- LIFT = Confidence / Support
  = 17.5% / 10%
  = 1.75

Apriori

ALGORITHM

1. Set a min support & confidence
2. Take all the Subsets in transactions
3. Take all the rules these subsets having higher confidence than minimum confidence
4. Sort the rules by decreasing lift

Let's CODE!

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