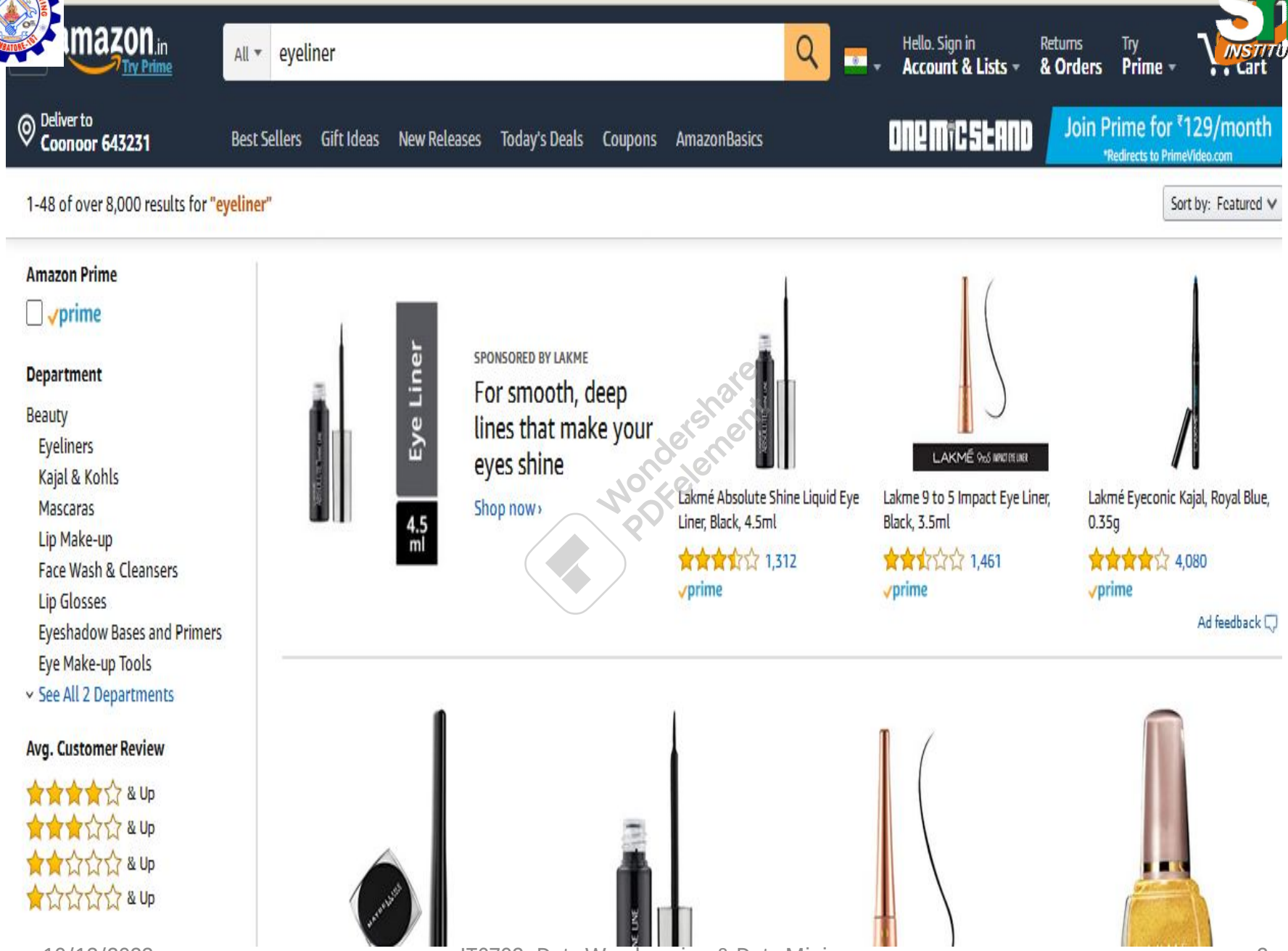
Association Based Classification

By

T.R.Lekhaa

AP/IT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Ad feedback

Association – Based Classification

- Frequent Patterns(FP) and their associations govern interesting relationships between attribute conditions (values) and class labels.

- Associative rules(AR) show strong associations between attribute-value pairs

- Associative classification where association rules are generated and analyzed to classify the data.

Two step process:

- Generate FPs
- Rule generation

Example:

- Gender = Female ^ makeup = likes → buys_eyeliner = yes
- Gender= Female ^ makeup=notlike → buys_eyeliner = no
- Gender = Male ^ makeup= notlike → buys_eyeliner = no
- Gender = Male ^ makeup= like → buys_eyeliner =yes

Confidence of a rule:

For a given rule R, the percentage of tuples in D satisfying the rule antecedent that also have the class label C

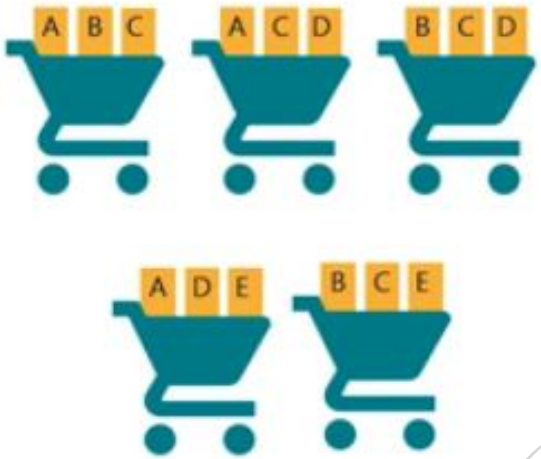
E.g: Confidence=93% ie., female and makeup is likes belong to the class buys_eyeliner = yes

Support of a rule:

For a given rule R, the percentage of tuples in D satisfying the rule antecedent that also have the class label C

E.g: Support=20% ie., female and makeup is likes belong to the class buys_eyeliner = yes

Association rule mining



Transaction at a Local Market

T1	A	B	C
T2	A	C	D
T3	B	C	D
T4	A	D	E
T5	B	C	E

Rule	Support	Confidence
A=>D	2/5	2/3
C=>A	2/5	2/4
A=>C	2/5	2/3
B, C=>A	1/5	1/3

Apriori Algorithm

TID	Items
T1	1 3 4
T2	2 3 5
T3	1 2 3 5
T4	2 5
T5	1 3 5

C1

Itemset	Support
{1}	3
{2}	3
{3}	4
{4}	1
{5}	4

Only Items present in F1

TID	Items
T1	1 3 4
T2	2 3 5
T3	1 2 3 5
T4	2 5
T5	1 3 5

C2

Itemset	Support
{1,2}	1
{1,3}	3
{1,5}	2
{2,3}	2
{2,5}	3
{3,5}	3

F2

Itemset	Support
{1,3}	3
{1,5}	2
{2,3}	2
{2,5}	3
{3,5}	3

TID	Items
T1	1 3 4
T2	2 3 5
T3	1 2 3 5
T4	2 5
T5	1 3 5

F3

Itemset	Support
{1,3,5}	2
{2,3,5}	2

Applying Rules to Item set F3

1. {1,3,5}

- ✓ Rule 1: **{1,3} → ({1,3,5} - {1,3})** means 1 & 3 → 5
  Confidence = support(1,3,5)/support(1,3) = 2/3 = 66.66% > 60%
  Rule 1 is selected

- ✓ Rule 2: **{1,5} → ({1,3,5} - {1,5})** means 1 & 5 → 3
  Confidence = support(1,3,5)/support(1,5) = 2/2 = 100% > 60%
  Rule 2 is selected

- ✓ Rule 3: **{3,5} → ({1,3,5} - {3,5})** means 3 & 5 → 1
  Confidence = support(1,3,5)/support(3,5) = 2/3 = 66.66% > 60%
  Rule 3 is selected