CSE 601

Association Analysis Report

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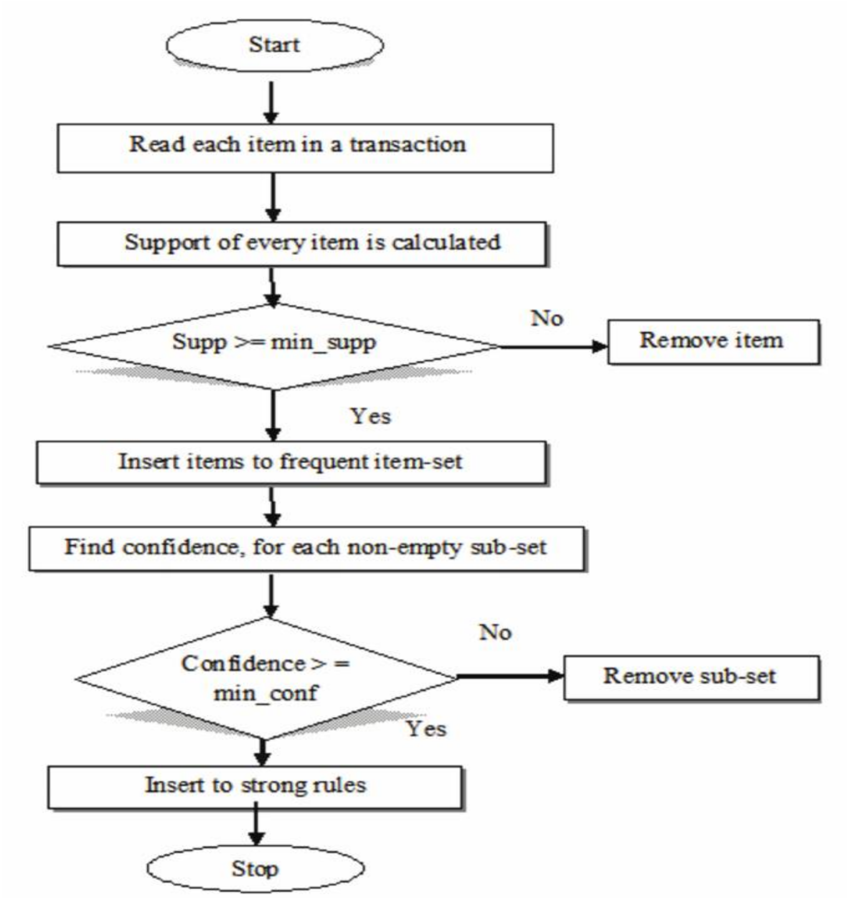
Apriori Principle:

Apriori algorithm is useful in mining frequent item sets and relevant association rules. It's used to find groups of items that occur together frequently in a dataset. Usually, this algorithm works on a database containing a large number of transactions.

Flow Chart:


Start
Read each item in a transaction
Support of every item is calculated
Supp >= min_supp
No
Remove item
Yes
Insert items to frequent item-set
Find confidence, for each non-empty sub-set
Confidence > = min_conf
No
Remove sub-set
Yes
Insert to strong rules
Stop

Flow chart of apriori algorithm for rules generation

Steps followed to design:

1.Read the data from the given dataset and add features of each disease to set and maintain list of sets for all the records from input file

2.Read all the attributes and append the attributes whose support is greater than given support to a frequent item set

3.Then we feed this 1-length item set to generate the 2-length item set by using union operator and checking minimum support condition. Again two length frequent item sets are merged and sets of length three are selected as frequent item sets. In this way all frequent item sets up to k length are generated.

4.We save all length frequent item sets in the dictionary for generating rules.

5.Now iterate through all the item sets in the dictionary and generate combinations for each frequent item set and find confidence of each rule.

6.Save all the rules whose confidence is greater than given minConfidence to pandas dataframe

7.Now according to the query input retrieve the rules from data frame and print them

1. Support is set to be 30%

Number of length-1 frequent item sets	196
Number of length-2 frequent item sets	5340
Number of length-3 frequent item sets	5287
Number of length-4 frequent item sets	1518
Number of length-5 frequent item sets	438
Number of length-6 frequent item sets	88
Number of length-7 frequent item sets	11
Number of length-8 frequent item sets	1
Number of all-length frequent item sets	12879

2. Support is set to be 40%

Number of length-1 frequent item sets	167
Number of length-2 frequent item sets	753
Number of length-3 frequent item sets	149
Number of length-4 frequent item sets	7
Number of length-5 frequent item sets	1
Number of all-length frequent item sets	1077

3. Support is set to be 50%

Number of length-1 frequent item sets	109
Number of length-2 frequent item sets	63
Number of length-3 frequent item sets	2

Number of all-length frequent item sets	174

4. Support is set to be 60%

Number of length-1 frequent item sets	34
Number of length-2 frequent item sets	2
Number of all-length frequent item sets	36

5. Support is set to be 70%

Number of length-1 frequent item sets	7
Number of all-length frequent item sets	7

1. Template 1 queries:

QUERY	COUNT
(result11, cnt) = asso_rule.template1("RULE", "ANY", ['G59_Up'])	26
(result12, cnt) = asso_rule.template1("RULE", "NONE", ['G59_Up'])	91
(result13, cnt) = asso_rule.template1("RULE", 1, ['G59_Up', 'G10_Down'])	39
(result14, cnt) = asso_rule.template1("HEAD", "ANY", ['G59_Up'])	9
(result15, cnt) = asso_rule.template1("HEAD", "NONE", ['G59_Up'])	108
(result16, cnt) = asso_rule.template1("HEAD", 1, ['G59_Up', 'G10_Down'])	17
(result17, cnt) = asso_rule.template1("BODY", "ANY", ['G59_Up'])	17
(result18, cnt) = asso_rule.template1("BODY", "NONE", ['G59_Up'])	100
(result19, cnt) = asso_rule.template1("BODY", 1, ['G59_Up', 'G10_Down'])	24

2. Template 2 queries:

QUERY	COUNT
(result21, cnt) = asso_rule.template2("RULE", 3)	9
(result22, cnt) = asso_rule.template2("HEAD", 2)	6
(result23, cnt) = asso_rule.template2("BODY", 1)	117

3.Template 3 queries:

QUERY	COUNT

(result31, cnt) = asso_rule.template3("1or1", "HEAD", "ANY", ['G10_Down'], "BODY", 1, ['G59_Up'])	24
(result32, cnt) = asso_rule.template3("1and1", "HEAD", "ANY", ['G10_Down'], "BODY", 1, ['G59_Up'])	1
(result33, cnt) = asso_rule.template3("1or2", "HEAD", "ANY", ['G10_Down'], "BODY", 2)	11
(result34, cnt) = asso_rule.template3("1and2", "HEAD", "ANY", ['G10_Down'], "BODY", 2)	0
(result35, cnt) = asso_rule.template3("2or2", "HEAD", 1, "BODY", 2)	117
(result36, cnt) = asso_rule.template3("2and2", "HEAD", 1, "BODY", 2)	3