

TO GENERATE A FREQUENCY ITEM GIVEN min\_support=40%

step1: To calculate the mean support count

given; total number of transactions, n=7

min\_support= 40% Or 0.4

then,

$$\text{min\_support\_count} = n * \text{min\_support\_threshold}$$

$$= 7 * 0.4$$

$$= 2.8$$

Mean support count is approximated to 3.

step2: To generate frequent 1-item sets, L1

-Counting the occurrences of each single item in the transactions

item	count
Beer	4
Bread	6
Milk	5
Chips	2
Mustard	2
Diaper	5
Eggs	1
coke	3

- In frequent 1-item sets, count less than 3 are discarded

$$L1 = \{\{Bread\}, \{Milk\}, \{Beer\}, \{Diaper\}, \{Coke\}\}.$$

step3: To generate frequent 2-items sets, L2

- Will be generated from the L1 and their support counts are calculated
- The sets with less than 3 counts will be discarded

item	count
{Bread,Milk}	5
{Bread, Beer}	3
{Bread, Diaper}	5
{Bread,Coke}	2
{Milk, Beer}	3
{Milk, Diaper}	5
{Milk, Coke}	2
{Beer, Diaper}	4
{Beer,Coke}	1
{Diaper,Coke}	2

Therefore;

$$L2 = \{\{Bread,Milk\}, \{Bread, Beer\}, \{Bread, Diaper\}, \{Milk, Beer\}, \{Milk, Diaper\}, \{Beer, Diaper\}\}$$

step4: To generate the frequent 3-item sets, L3

- This will be generated from L2 where their support counts

item	count
{Beer, Diaper,Bread}	3
{Beer, Milk,Diaper}	3
{Beer, Bread,Milk}	3
{Bread,Milk,Diaper}	4

Therefore;

$$L3 = \{\{Beer, Diaper,Bread\}, \{Beer, Milk,Diaper\}, \{Beer, Bread,Milk\}, \{Bread,Milk,Diaper\}\}.$$

Step5: To Count the occurrences of frequent 4-item sets, L4

- This will be generated from L3 with their count

item	count
{Beer, Diaper,Bread,Milk}	3

Therefore;

$$L4 = \{Beer, Diaper,Bread,Milk\}$$

- The process stops since no item sets 5 or more items that appear in atleast 3 transactions.

GENERALLY;

The frequent item sets with minimum support 40% are:

- 1-item sets: {{Bread},{Milk},{Beer},{Diaper},{Coke}}
- 2-item sets: {{Bread,Milk}, {Bread, Beer}, {Bread, Diaper}, {Milk, Beer}, {Milk, Diaper}, {Beer, Diaper}}
- 3-item sets: {{Beer, Diaper,Bread}, {Beer, Milk,Diaper}, {Beer, Bread,Milk}, {Bread,Milk,Diaper}}
- 4-item sets: {Beer, Diaper,Bread,Milk}