

FP growth algorithm

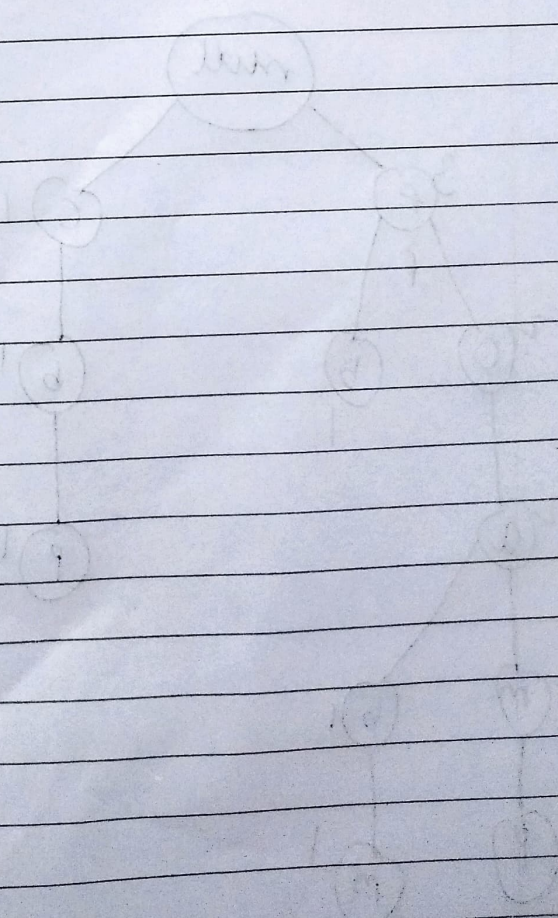
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Q1) Apply FP-growth algorithm. Let the min sup=3
Find all frequent itemsets using FP-growth algorithm

TID	Items
T ₁₀₀	f, a, c, d, g, i, m, p
T ₂₀₀	a, b, c, f, l, m, o
T ₃₀₀	b, f, h, j, o
T ₄₀₀	b, c, k, s, p
T ₅₀₀	a, f, c, e, l, p, m, n

Items	Frequency
a	3
b	3
c	4
d	1
e	1
f	4
g	1
h	1
i	1
j	1
k	1
l	2
m	3
n	1
o	2
p	3
s	1



Itemset

Sup-count

f 4

c 4

a 3

b 3

m 3

p 3

TID

List of items

T₁₀₀

{f, c, a, m, p}

T₂₀₀

{f, c, a, b, m}

T₃₀₀

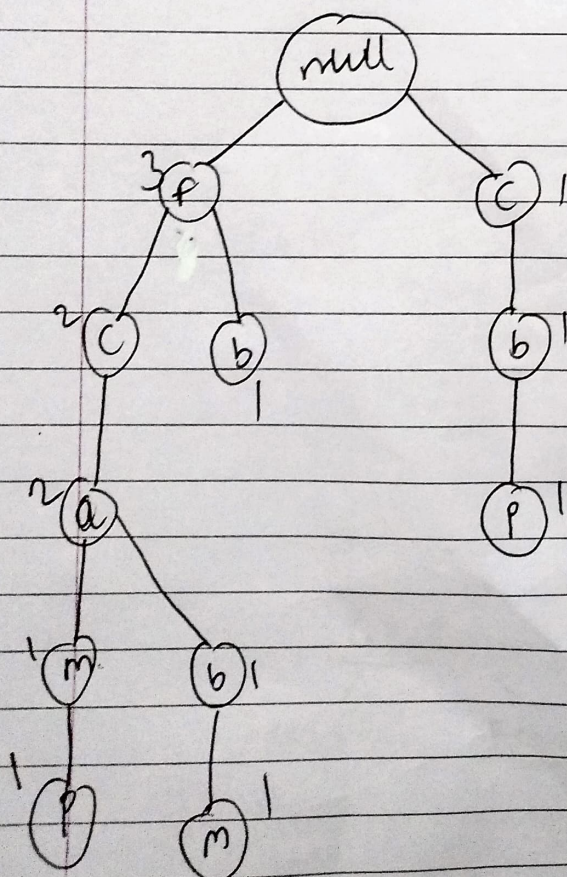
{f, b, y}

T₄₀₀

{c, b, p}

T₅₀₀

{f, c, a, m, p}



Item	Conditional pattern base	Conditional FP-tree
p	$\{ \{f, c, a, m : 2\}, \{c, b : 1\} \}$	$\{c : 3\}$
m	$\{ \{f, c, a : 2\}, \{f, c, a, b : 1\} \}$	$\{f, c, a : 3\}$
b	$\{ \{f, c, a : 1\}, \{f : 1\}, \{c : 1\} \}$	\emptyset
a	$\{ \{f, c : 3\} \}$	$\{f, c : 3\}$
c	$\{ \{f : 3\} \}$	$\{f : 3\}$
f	\emptyset	\emptyset

Frequent patterns generated

p	$\{c, p : 3\}$
m	$\{f, m : 3\}, \{c, m : 3\}, \{a, m : 3\}, \{f, c, m : 3\},$ $\{f, a, m : 3\}, \{c, a, m : 3\}$
b	\emptyset
a	$\{f, a : 3\}, \{c, a : 3\}, \{f, c, a : 3\}$
c	$\{f, c : 3\}$
f	\emptyset

⇒ A database has five transactions.
 Let min-sup = 60% & min-conf = 80%.
 Find all the frequent itemsets using
 FP-Growth

TID	Items_bought
T100	{M, O, N, K, E, Y}
T200	{D, O, N, K, E, Y}
T300	{M, A, K, E}
T400	{M, U, C, K, Y}
T500	{L, O, O, K, I, E}

⇒ min-sup = 60%
 ∴ Sup. count to be satisfied = $5 \times 0.6 = 3$

Step 1: Count each Itemset

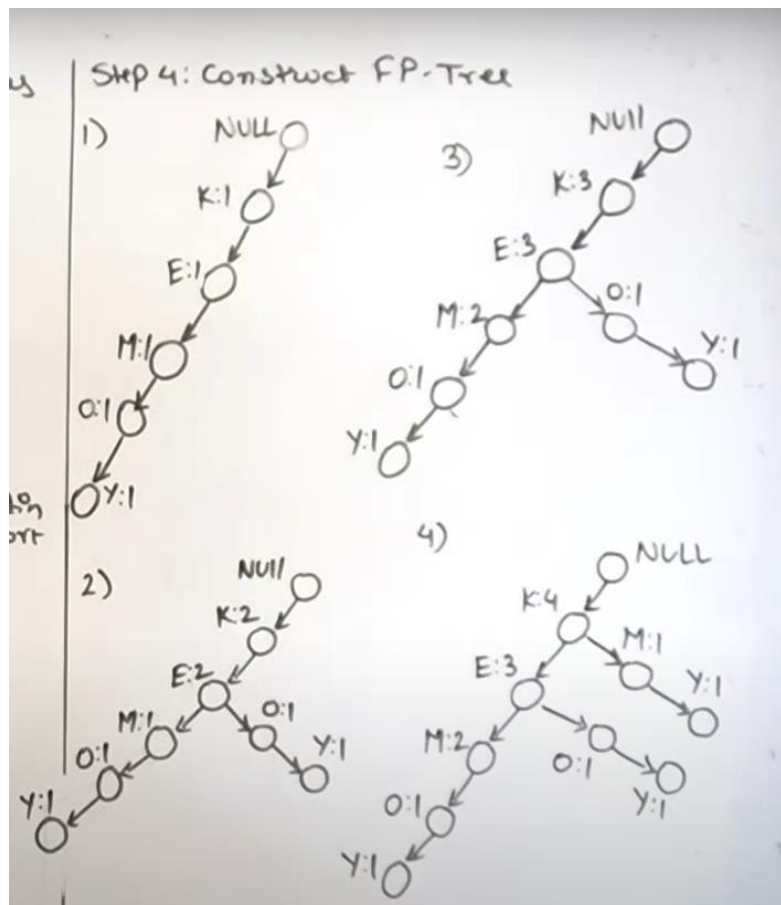
Itemset	Sup. count
{A}	1 ^x
{C}	2 ^x
{D}	1 ^x
{E}	4
{I}	1 ^x
{K}	5
{M}	3
{N}	2 ^x
{O}	3
{U}	1 ^x
{Y}	3

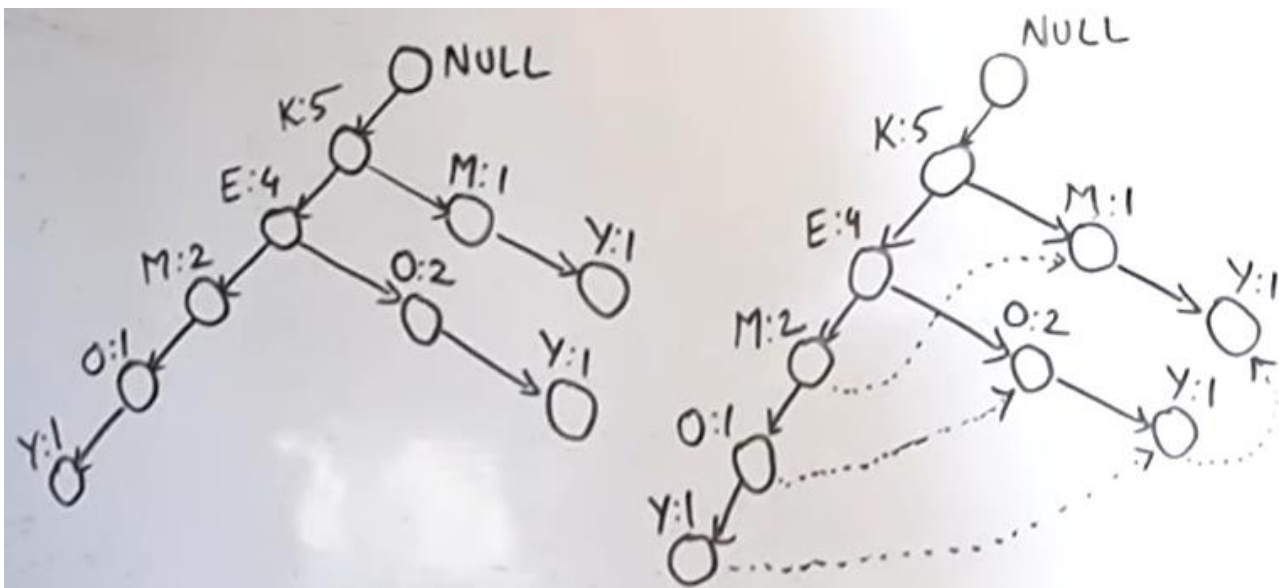
Step 2: Discard A, C, D, I, N, U as
 it does not satisfy sup. count &
 Arranging remaining items in
 descending order of sup. count

Itemset	Sup. count
{K}	5
{E}	4
{M}	3
{O}	3
{Y}	3

Step 3: Sort items in each transaction
 according to descending support
 count

TID	List of items
T100	{K, E, M, O, Y}
T200	{K, E, O, Y}
T300	{K, E, M}
T400	{K, M, Y}
T500	{K, E, O}





Itemset	Conditional Pattern base	Conditional FP Tree	Frequent Patterns Generated
{Y}	{ {K, E, M, O:1}, {K, E, O:1}, {K, M:1} }	(K:3)	{K, Y:3}
{O}	{ {K, E, M:1}, {K, E:2} }	(K:3, E:3)	{K, O:3}, {E, O:3}, {K, E, O:3}
{M}	{ {K, E:2}, {K:1} }	(K:3)	{K, M:3}
{E}	{ {K:4} }	(K:4)	{K, E:4}
{K}	-	-	-