

## FP-Growth Exercise

In this problem, we will begin with the dataset to the right, and develop all frequent itemsets and their support counts. The minimum support count for frequent itemsets is  $4 = \text{minsup}$ . We will use FPGrowth.

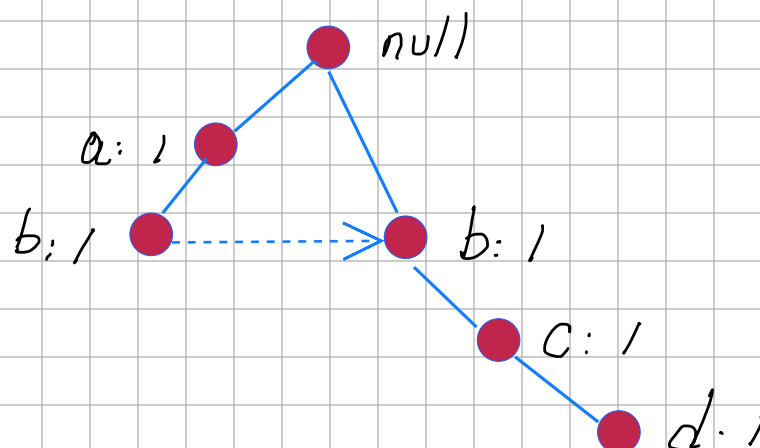
Transaction  
Data Set

TID	Items
1	{a,b}
2	{b,c,d}
3	{a,c,d,e}
4	{a,d,e}
5	{a,b,c}
6	{a,b,c,d}
7	{a}
8	{a,b,c}
9	{a,b,d}
10	{b,c,e}

- (a) Find the supports of all 1-itemsets, in descending order of support. Retain the frequent itemsets.

or  
set

- (b) Draw the F-P tree after the first 2 transactions. Why can we ignore "e" in the baskets?

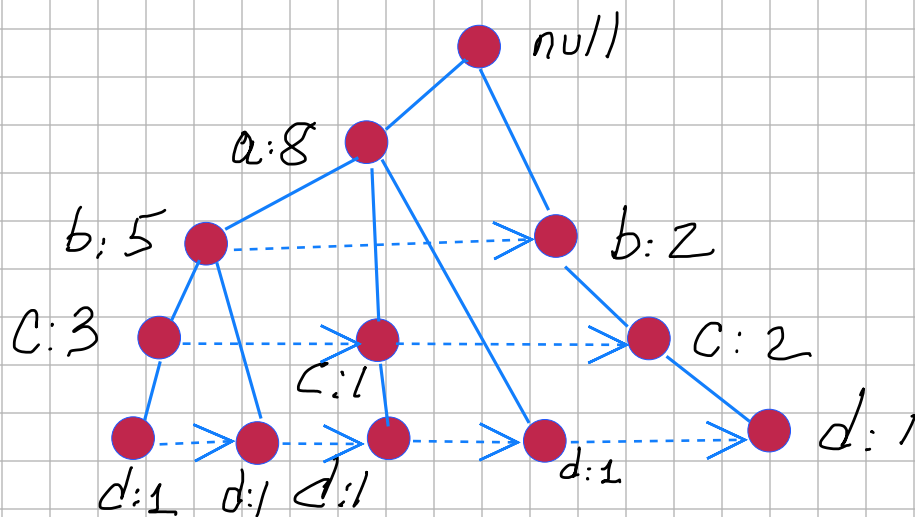


(c.) Draw the FP-tree after transaction 4.

(d.) Draw the FP-tree after transaction 6.

(e) Draw the FP-tree after transaction 8.

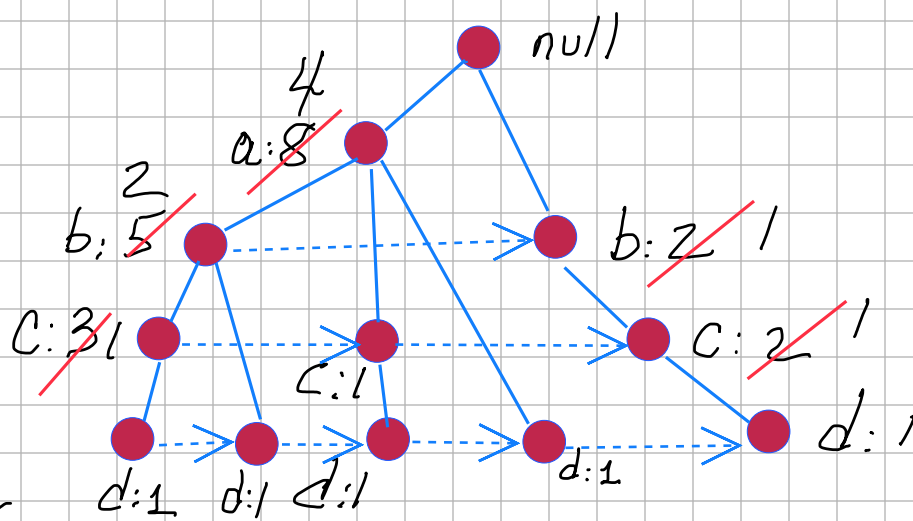
(f) Draw the FP-tree after transaction 10.



(g) From (f), explain how to compute the support of  $\{d\}$ . Why is  $\{d\}$  frequent?

(h) Use TSK p369, 3.) to find the conditional FP tree of  $d$ .


adjust supports for paths ending in  $d$ .



remove  
d-nodes

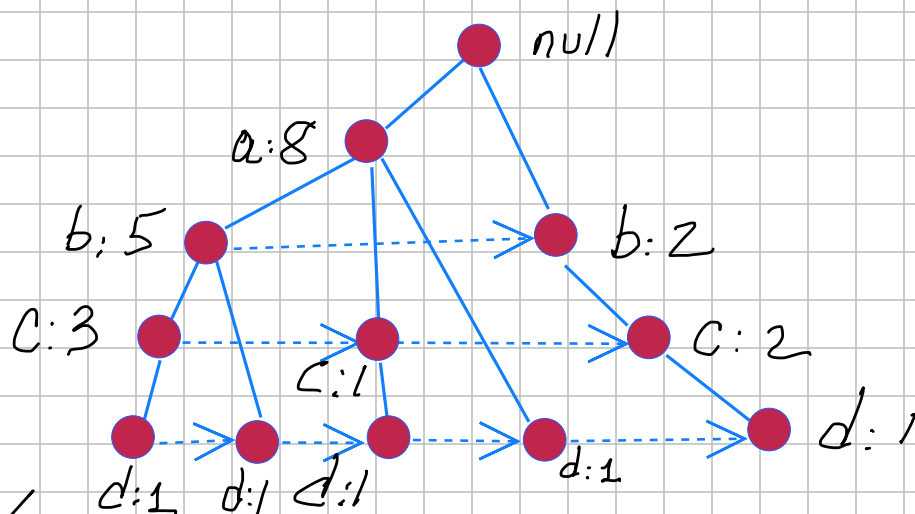
remove c-nodes (why?)

remove b-nodes (why?)



- (i) What are all the frequent itemsets containing d and other items obtained from this conditional FP tree?

(j) Find the conditional FP tree for c.

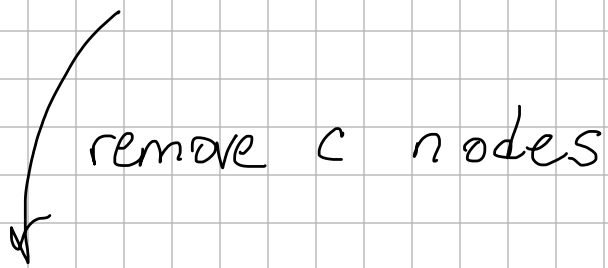


adjust supports for paths ending  
in c

c

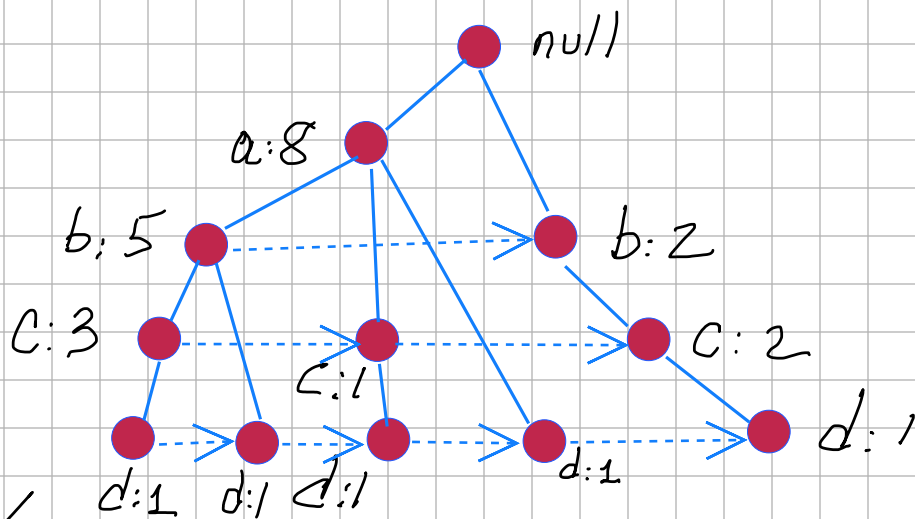
remove paths not ending in c

remove c nodes



K) What are all the frequent itemsets containing  $c$  and other items obtained from this conditional FP tree?

L) Find the conditional FP-Tree for  $b$ .



adjust supports for paths  
ending in  $b$ .

$b$   
 $c:3$



remove paths  
not ending in  
b null

remove 6 nodes

m) What are all the frequent itemsets containing  $b$  and other items obtained from this conditional FP tree?

n) List all frequent itemsets and their supports in lexicographical order.

itemset	support
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o.) List all association rules with minimum support of 4 in descending order of confidence

association rule	confidence
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