

## w5

● Graded

1 Day, 23 Hours Late

### Group

Mihret Kemal

Tagore Kosireddy

Feven Tefera

...and 1 more

[View or edit group](#)

### Total Points

72 / 70 pts

### Question 1

Question 1

18.5 / 22 pts

1.1 Q1a

2.5 / 3 pts

✓ - 0.5 pts Off by one

Correct number of frequent itemsets:  
 $2^8 - 1 = 255$

1.2 Q1b

4 / 4 pts

✓ - 0 pts Correct

1.3 Q1c

12 / 15 pts

✓ - 3 pts three errors

### Question 2

Question 2

29 / 30 pts

✓ - 1 pt Missing  $C_5, L_5$

Question 3

Question 3

24.5 / 18 pts

3.1 Q3a

18 / 18 pts

✓ - 0 pts Correct

3.2 Q3b - bonus

6.5 / 0 pts

✓ + 8 pts Full Credit

✓ - 1 pt extra unnecessary row

✓ - 0.5 pts minor error



✓ - 0 pts missing full frequent itemsets

No questions assigned to the following page.

Group Name	Charlie
Group Member 1	Feven Tefera
Group Member 2	Mihret Kemal
Group Member 3	Tagore Kosireddy
Group Member 4	Michael Ngala

Question assigned to the following page: [1.1](#)

**Q1**

Given a database of transactions and a min-support = 2,

Trans.	Items
T1	A, B, C, D, E, F, G, H, J, K
T2	A, B, C, D, E, F, G, H
T3	A, B, C, D, E
T4	F, G, H
T5	K, P, Q, R, S

- (a) How many frequent patterns exist? *Note, you should not list what they are, just provide the number.*

**256**

Question assigned to the following page: [1.2](#)

- (b) Find an example of an association rule that matches the following pattern with min-support = 2 and min-conf = 0.70,

$$(A, B, C, D, ItemX \rightarrow ItemY).$$

That is, what are the items replace *ItemX* and *ItemY*. *There may be more than one correct answer.*

*ItemX* = **F**

*ItemY* = **E**



Question assigned to the following page: [1.3](#)

- (c) For each of the following association rules, report the support, confidence, lift, leverage, and conviction.

$$A \rightarrow F$$

$$B, C \rightarrow K$$

	Rule	support	confidence	lift	leverage	conviction
$F, K \rightarrow A, B, C$	$A \rightarrow F$	2	0.667	1.11	0.04	1.2
	$B, C \rightarrow K$	1	0.33	0.83	-0.04	0.9
	$F, K \rightarrow A, B, C$	1	1	1.667	0.08	Inf

Question assigned to the following page: [2](#)

**Q2**

TID	Items
T1	B, D, F, G, I, J
T2	C, B, D, G, I, J
T3	D, F, G, H
T4	A, D, J, K
T5	A, B, D, E, G
T6	A, B, D, G, I
T7	A, D, G

Consider the data listed in table above. Show the operation of the Apriori algorithm. Show the majors steps: present  $L_i$  and  $C_i$  for each level  $i$  identified. Also, report at the end the frequent itemsets identified. Use a min-support threshold of 3.

Report  $C_i$  and  $L_i$  in tables with the support for each itemset. Present itemsets in alphabetical order, e.g., A, D, G, AB, AD, BD, DC, etc. If the algorithm halts report a single row of NAs in the remaining tables.

$C_1$	$L_1$	$C_2$	$L_2$	$C_3$	$L_3$
{A}   4	{A}   4	{A,B}   2	{A,D}   4	{A,D,G}   3	{A,D,G}   3
{B}   4	{B}   4	{A,D}   4	{A,G}   3	{B,D,G}   4	{B,D,G}   4
{C}   1	{D}   7	{A,G}   3	{B,D}   4	{B,D,I}   3	{B,D,I}   3
{D}   7	{G}   6	{A,I}   1	{B,G}   4	{B,G,I}   3	{B,G,I}   3
{E}   1	{I}   3	{A,J}   1	{B,I}   3	{D,G,I}   3	{D,G,I}   3
{F}   2	{J}   3	{B,D}   4	{D,G}   6		
{G}   6		{B,G}   4	{D,I}   3		
{H}   1		{B,I}   3	{D,J}   3		
{I}   3		{B,J}   2	{G,I}   3		
{J}   3		{D,G}   6			
{K}   1		{D,I}   3			
		{D,J}   3			
		{G,I}   3			
		{G,J}   2			
		{I,J}   2			
$C_4$	$L_4$				
{B,D,G,I}   3	{B,D,G,I}   3				

f = { L1, L2, L3, L4}

The frequent itemsets are { A,B, D, G, I, J, AD, AG, BD, BG, BI, DG, DI, DJ, GI, ADG, BDG, BDI, BGI, DGI, BDGI}

Question assigned to the following page: [3.1](#)

## Q3

Consider the data listed in table above. Run the FP-growth algorithm.

- (a) This should include the header table, node links and the tree. See slides 51-62 of 07.association-analysis.part1 slide deck. You should create something like slide 62. Remember to order your header table; if there are any ties sort alphabetically.

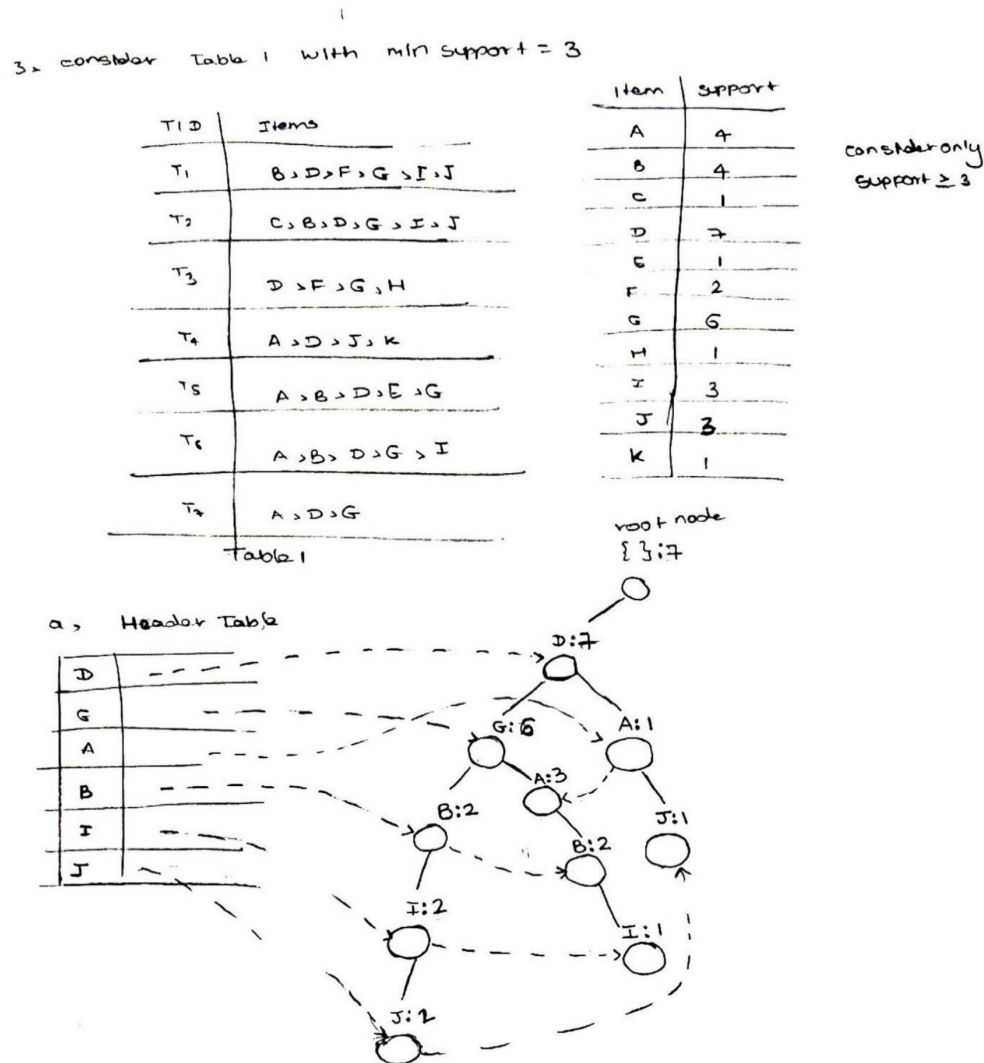


Figure 1: FP-tree with header table

Question assigned to the following page: [3.2](#)

- (b) Report the conditional pattern base table. There should be a column for items, conditional pattern, conditional FP-tree, and frequent patterns. See slide 64-73 and 74-81 of 07.association-analysis.part1 slide deck. The table you create should look like slide 81. *Remember to order the addition of items to this conditional pattern base table.*

Item	Cond. Pattern	Cond. FP-tree	Frequent Pattern
J	{{D, G, B, I: 2}, {D, A: 1}}	<D:3 >	{D,J:3}
I	{{D, G, B : 2},{D, G, A, B: 1}}	<D:3, G:3, B:3 >	{{D, I :3}, { G, I :3}, {B, I :3}, {D, G, I: 3},{ D, B, I:3}, {G, B, I: 3}, {D, G, B, I: 3}}
B	{D, G:2},{D, G, A:2}	<D:4, G:4 >	{{D, B:4}, {G,B :4}, {D, G, B:4}}
A	{ {D, G:3},{D:1}}	<D:4, G:3 >	{D, A: 4}, {G, A: 3},{D, G, A: 4}
G	{D : 6}	<D:6 >	{D,G :6}
D	-	-	-