4.2.5.4 练习4.2 FP-Growth & Apriori

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

min sup = 2

Q(a) FP-Growth

(b) Apriori

Solution (a) ① construct FP-tree

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

Header Table. same.

items	σ
A	8
B	7
C	6
D	5
E	3

sorted frequent list

Same.

frequent pattern

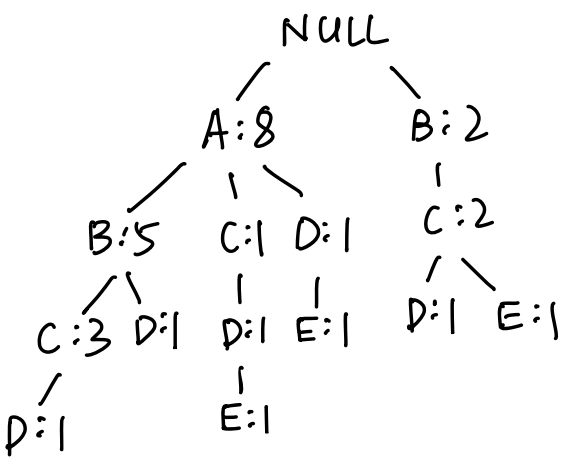
E = 3

D = 5

C = 6

B = 7

A = 8

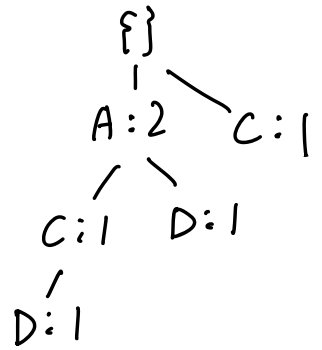


② E - conditional pattern base

{ACD:1 , AD:1 , BC:1}

⇒ {A:2 , ~~B:1~~ , C:2 , D:2}

⇒ {ACD: 1 , AD:1 , C:1}



⇒ FP

AE = 2 CE = 2 DE = 2

③ DE conditional pattern tree

{AC:1 , A:1}

⇒ {A:2 , ~~C:1~~}

⇒ {A:2}

⇒ FP

ADE = 2

④ CE conditional pattern base

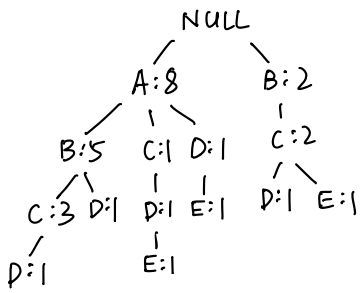
{A:1} => {A:1} => { } => no tree => no FP

⑤ AE conditional pattern base

{ } => { } => { } => no tree => no FP

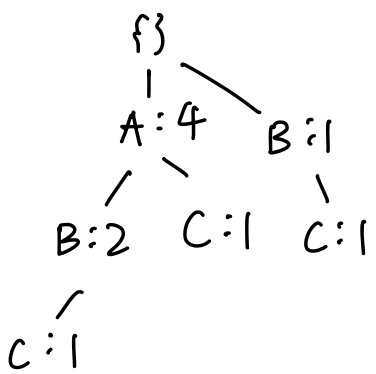
⑥ D conditional pattern base

{ABC:1, AB:1, AC:1, A:1, BC:1}



=> {A:4, B:3, C:3}

=> {ABC:1, AB:1, AC:1, A:1, BC:1}



=> FP

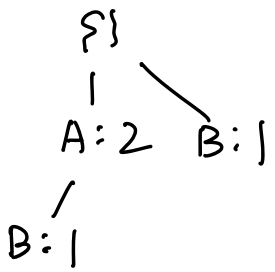
AD = 4, BD = 3, CD = 3

⑦ CD conditional pattern base

{AB:1, A:1, B:1}

=> {A:2, B:2}

=> { AB:1 , A:1 , B:1 }



=> FP

ACD=2 BCD=2

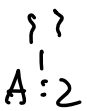
⑧ BCD CPB

{A:1} => {~~A:1~~} => { } => No free => no FP

⑨ ACD C PB

{} => {} => { } => No free => no FP

⑩ B D C PB

{A:2} => {A:2} => {A:2} => 

=> FP : ABD =2

⑪ A D C PB

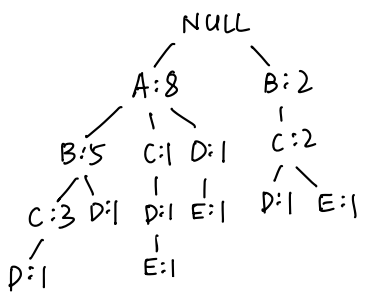
{} => {} => { } => No free => no FP

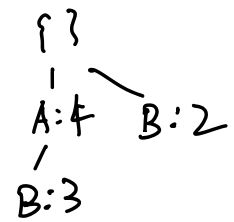
⑫ C C PB

{AB:3 , A:1 , B:2}

=> {A:4 , B:5}

=> {AB:3 , A:1 , B:2} sorted CPB





=> FP

BC=5 AC=4

⑬ AC CPB

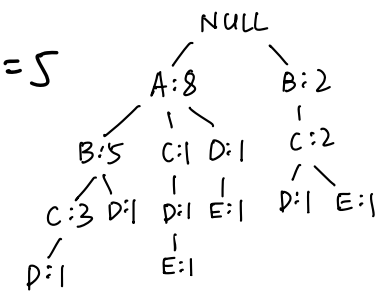
{B:3} => {B:5} => {B:3} => {} / B:3 => FP: ABC=3

⑭ BC CPB

{} => {} => {} => No free => no FP

⑮ B CPB

{A:5} => {A:5} => {A:1} => {} / A:5 => FP: AB=5



⑯ A CPB

{} => {} => {} => No free => no FP

⑰ Final FP

E=3 AE=2 CE=2 DE=2 ADE=2

D=5 AD=4, BD=3, CD=3

ACD=2, BCD=2, ABD=2

C=6 BC=5, AC=4, ABC=3

B=7 AB=5

A=8

(b) A priori :

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

items	σ
A	8
B	7
C	6
D	5
E	3

$C_1' = \{A, B, C, D, E\}$

$C_1 = \{A:8, B:7, C:6, D:5, E:3\}$

$L_1 = \{A:8, B:7, C:6, D:5, E:3\}$

$C_2' = \{AB, AC, AD, AE, BC, BD, BE, CD, CE, DE\}$

$C_2 = \{AB:5, AC:4, AD:4, AE:2, BC:5, BD:3, \cancel{BE:1}$
$CD:3, CE:2, DE:2\}$

$L_2 = \{AB:5, AC:4, AD:4, AE:2, BC:5, BD:3,$
$CD:3, CE:2, DE:2\}$

$C_3' = \{ABC, ABD, \cancel{ABE}, ACD, ACE, ADE, BCD, \cancel{BCE}, \cancel{BDE}$
$CDE\}$

$C3 = \{ABC : 3, ABD: 2, ACD: 2, ACE: 1, ADE: 2, BCD: 2, CDE: 1\}$

$L3 = \{ABC : 3, ABD: 2, ACD: 2, ADE: 2, BCD: 2\}$

$C4' = \{ABCD, ABDE, ACDE\}$

$C4 = \{ABCD: 1\}$

$L4 = \{\}$

Final FP

L3 $\{ABC : 3, ABD: 2, ACD: 2, ADE: 2, BCD: 2\}$

L2 $\{AB: 5, AC: 4, AD: 4, AE: 2, BC: 5, BD: 3,$
$CD: 3, CE: 2, DE: 2\}$

L1 $\{A: 8, B: 7, C: 6, D: 5, E: 3\}$