No collaboration, Daisy Wang

1.1

(1)

Items (1-itemsets)

{Bread} 5 ✓
{Coke} 2 ✓
{Milk} 4 ✓
{Beer} 3 ✓
{Diaper} 4 ✓
{Eggs} 2 ✓

Pairs (2-itemsets)

{Bread, Coke} 1 ✗
{Bread, Milk} 3 ✓
{Bread, Beer} 2 ✓ →
{Bread, Diaper} 3 ✓
{Bread, Eggs} 2 ✓
{Coke, Milk} 2 ✓
{Coke, Beer} 1 ✗
{Coke, Diaper} 2 ✓
{Coke, Eggs} 0 ✗
{Milk, Beer} 2 ✓
{Milk, Diaper} 3 ✓
{Milk, Eggs} 0 ✗
{Beer, Diaper} 3 ✓
{Beer, Eggs} 1 ✗
{Diaper, Eggs} 1 ✗

Triplets (3-itemsets)

{Bread, Milk, Beer} 1 ✗
{Bread, Milk, Diaper} 2 ✓
{Bread, Beer, Diaper} 2 ✓
{Coke, Milk, Diaper} 2 ✓
{Milk, Beer, Diaper} 2 ✓

↓

(4-item sets)

None

All sets with "✓" are frequent itemsets with Min-supp = 2.

(2)

Brute-force = $^6C_1 + {}^6C_2 + {}^6C_3 + {}^6C_4 = 56$

Apriori = $6 + 15 + 5 + 0 = 26$

1.2 (1)

Header table

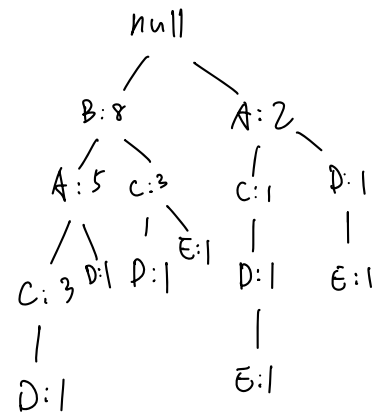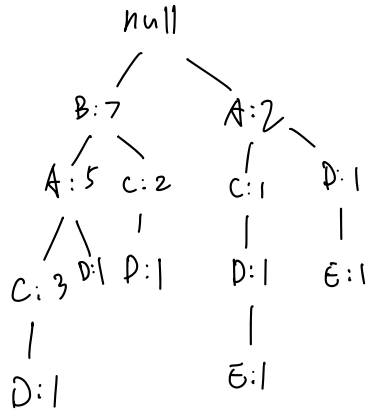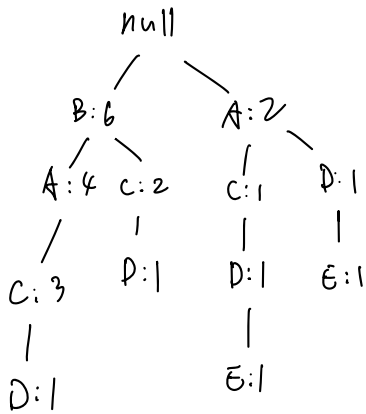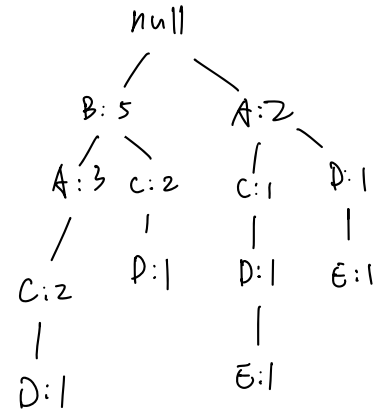A 7   B 8
B 8   A 7
C 7   sort   C 7
D 5   →   D 5
E 3   E 3

null
  B:1
   A:1

null
  B:2
  A:1 C:1
         D:1

null
  B:2   A:1
 A:1 C:1   C:1
       D:1   D:1
              E:1

null
  B:2   A:2
 A:1 C:1   C:1   D:1
      D:1   D:1   E:1
             E:1

null
  B:3   A:2
 A:2 C:1   C:1   D:1
  C:1 D:1   D:1   E:1
              E:1

null
  B:4   A:2
 A:3 C:1   C:1   D:1
 C:2 D:1   D:1   E:1
 D:1   E:1

null
  B:5   A:2
 A:3 C:2   C:1   D:1
 C:2 D:1   D:1   E:1
 D:1   E:1

null
  B:6   A:2
A:4 C:2   C:1   D:1
C:3 D:1   D:1   E:1
D:1   E:1

null
  B:7   A:2
A:5 C:2   C:1   D:1
C:3 D:1 D:1   D:1   E:1
D:1   E:1

null
  B:8   A:2
A:5 C:3   C:1   D:1
C:3 D:1 D:1 E:1 D:1   E:1
D:1   E:1

(2)

① Suffix E.

null
/   \
B:1 X   A:2
| | \
A 2   C:1   Ci 1   D:1
C 2 | | |
D 2   E:1   D:1   E:1
                  |
                  E:1

Conditional F-P tree

null
/   \
C:1   A:2
| \
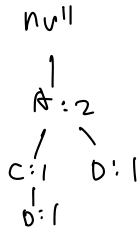C:1   D:1
|
D:1
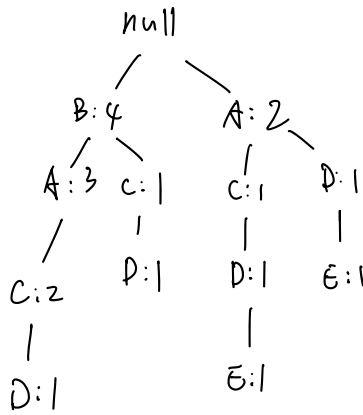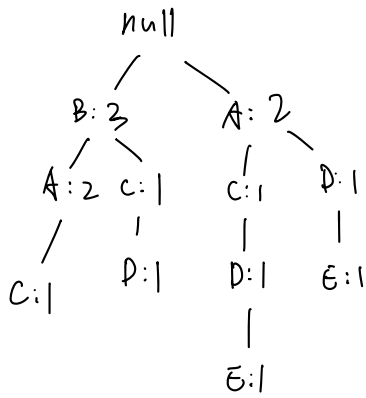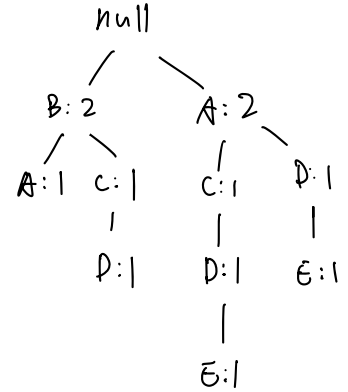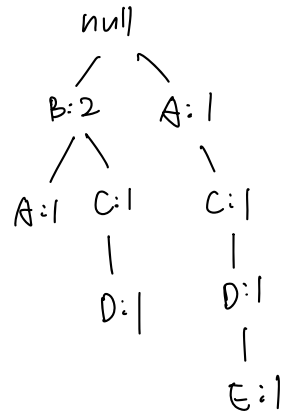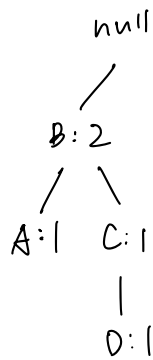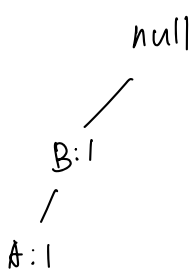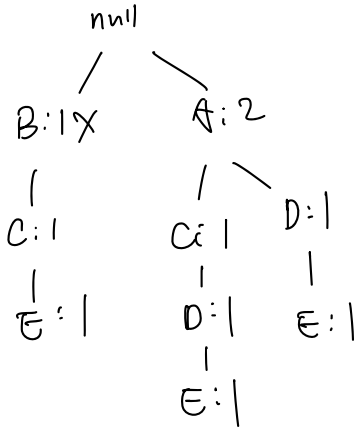
B = 1 < 2, Remove.
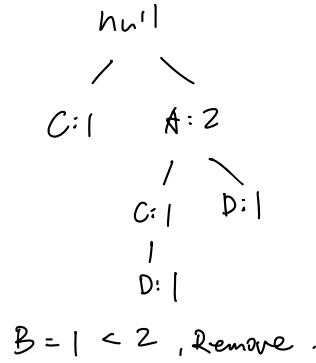
FI: E, DE, ADE,
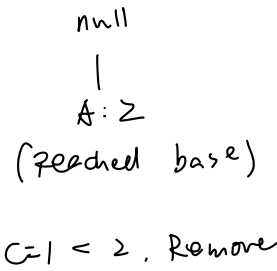CE, AE, D, CD,
BCD, ACD, BD,
ABD, AD, C,
AC, BAC, BC,
A, BA, B

Suffix DE

A 2
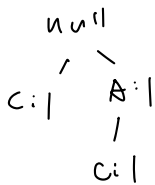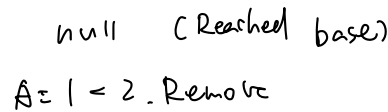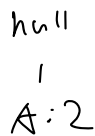
null
|
A:2
/   \
C:1   D:1
|
D:1

Conditional F-P tree

null
|
A:2
(reached base)

C=1 < 2. Remove

Suffix CE

null
/   \
C:1   A:1
|
Ci 1

Conditional F-P tree

null   (Reached base)
A = 1 < 2. Remove

Suffix AE

null
|
A:2

Conditional F-P tree

null (Reached base)

② Suffix D

A 4
B 3
C 3

null
/   \
B:3   A:2
/   \   /   \
A:2   C:1   C:1   P:1
/ \ | |
Ci 1 D:1 P:1   D:1
|
P:1

Conditional F-P tree

null
/   \
A:4   B:1
/   \   \
B:2   C:1   C:1
/
C:1

A   2
B   2
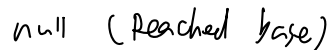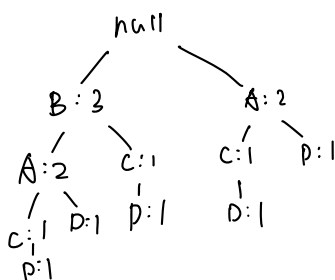
Suffix   CD

null
├── A:2
│   ├── B:1
│   │   └── C:1
│   └── C:1
└── B:1
    └── C:1
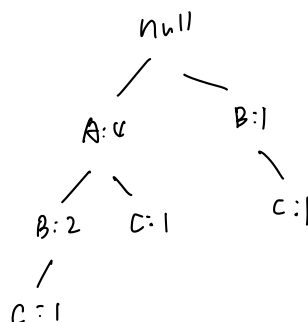
Conditional F-P tree
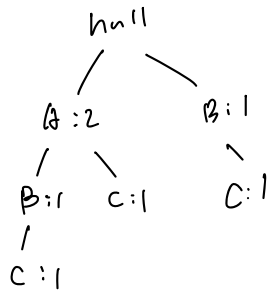
null
├── A:2
│   └── B:1
└── B:1
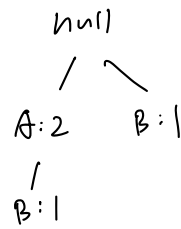
Suffix BCD
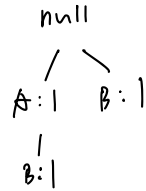
null
├── A:1
│   └── B:1
└── B:1

Conditional F-P tree

null (Reached base)
A=1<2, Remove
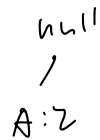
Suffix ACD

null
└── A:2

Conditional F-P tree

null (Reached base)

Suffix BD
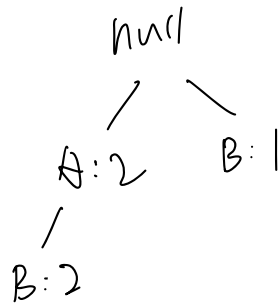
null
├── A:2
│   └── B:2
└── B:1

Conditional F-P tree

null
└── A:2 (Reached base)

Suffix AD

null
└── A:4
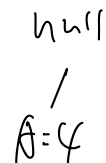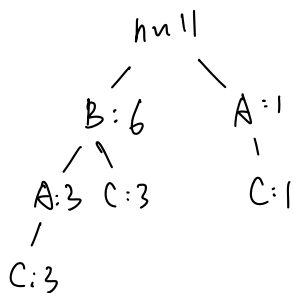
Conditional F-P tree

null (Reached base)

③ Suffix C   Conditional F-P tree

```
              null                          null
             /    \                        /    \
          B:6      A:1                   B:6      A:1
         /  \       \                   /
      A:3   C:3      C:1              A:3
      /
    C:3
```

B 6
A 4

Suffix AC   Conditional F-P tree

B 3
```
              null                          null
             /    \                        /
          B:3      A:1                   B:3  (Reached base)
         /
       A:3
```
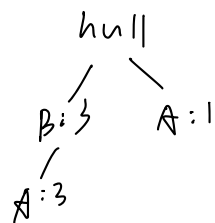
Suffix BC   Conditional F-P tree

```
              null                          null
             /                            (Reached base)
          B:6
```
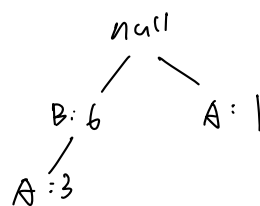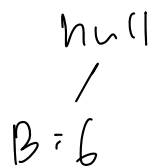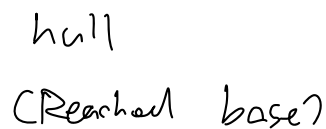
④ Suffix A   Conditional F-P tree

```
              null                          null
             /    \                        /
          B:5      A:2                   B:5
         /                              (Reached base)
       A:5
```
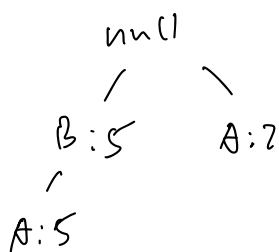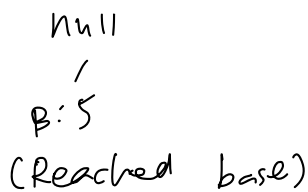
⑤ Suffix B   Conditional F-P tree

```
              null                          null
             /                            (Reached base)
          B:8
```