LAB - 08 :   FP - Growth

Example-1

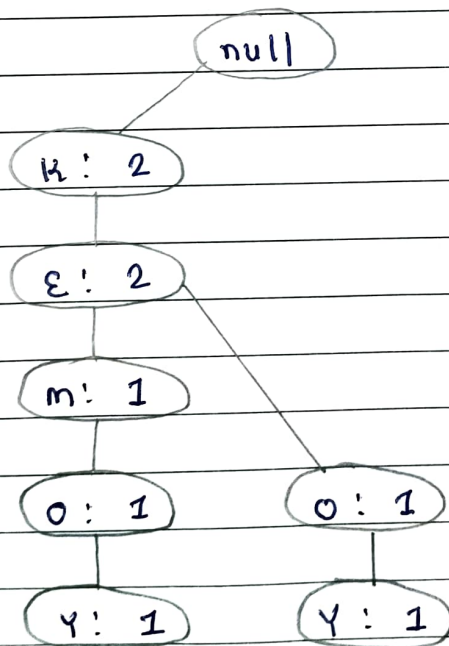| TID	Items
1	E K M N O Y
2	D E K N O Y
3	A E K M
4	C K M U Y
5	C E I K O

Solution :   Minimum support = 3

Step-1

item	Count
A	1
C	2
D	1
E	4
I	1
K	5
M	3
N	2
O	3
U	1
Y	3

Step-2   { K : 5, E : 4, O : 3, M : 3, Y : 3 }

TID	items
1	K E M O Y
2	K E O Y
3	K E M
4	K M Y
5	K E O

L

step-3

```
                    (null)
                      |
              ( k : 1 )
                  |
              ( ε : 1 )
                  |
              ( m : 1 )
                  |
              ( o : 1 )
                  |
              ( Y : 1 )


                    (null)
                      |
              ( k : 2 )
                  |
              ( ε : 2 )
                  |         \
              ( m : 1 )      \
                  |           \
              ( o : 1 )     ( o : 1 )
                  |            |
              ( Y : 1 )     ( Y : 1 )
```

```
                    null
                   /
          k : 3
             \
          ε : 3
            |    \
          m : 2   \
            |       \
          o : 1      o : 1
            |          |
          Y : 1      Y : 1
```

```
                    null
                   /
          k : 4
            |    \
          ε : 3   \
            |  \    \
          m : 2 \    m : 1
            |     \     |
          o : 1   o : 1  |
            |       |    |
          Y : 1   Y : 1  Y : 1
```

```
                    null
                   /
              K : 5
                |    \
              E : 4    \
              /   \     \
          m : 2   \      m : 1
           |       \       |
          O : 1    O : 2   |
           |        |      |
          Y : 1    Y : 1   Y : 1
```
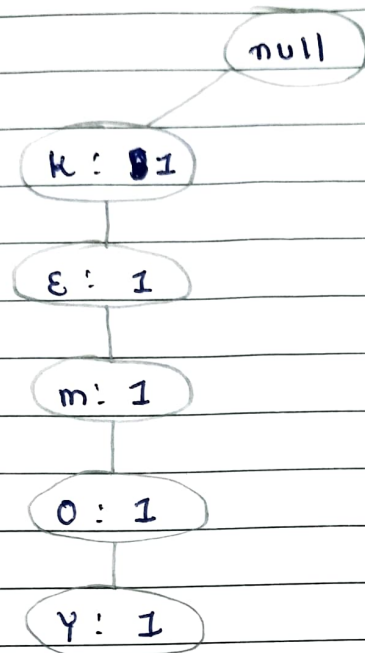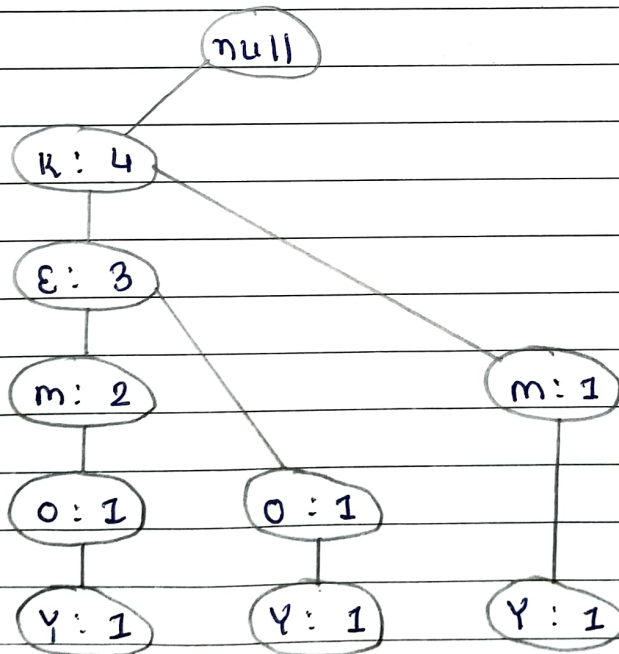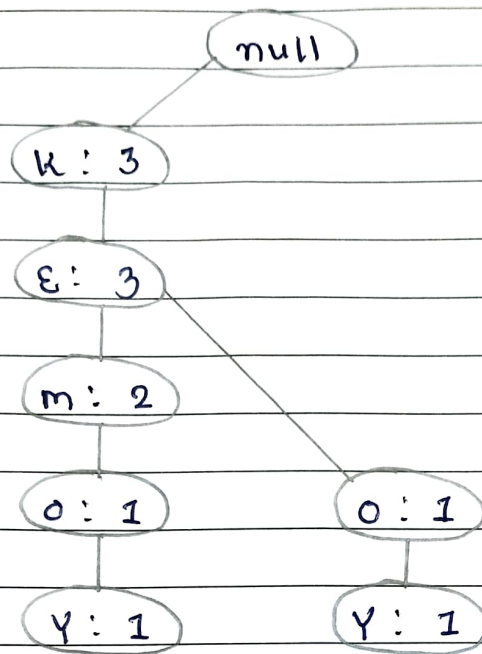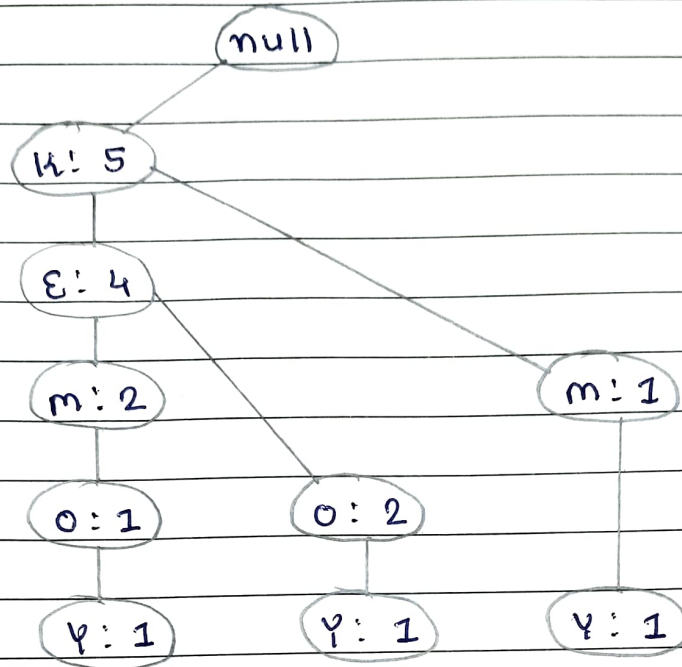
Step: 4	item	conditional Pattern Base
	Y	{KEmO : 1} {KEO : 1} {Km : 1}
	O	{KEm : 1} {KE : 02}
	m	{KE : 2} {K : 1}
	E	{K : 4}
	K	—

Step: 5

item	Conditional Pattern Base	Conditional FP-tree
Y	{KEmo: 1}{KEO: 1}{Km: 1}	{K: 3}
m	{KE: 2} {K: 1}	{K: 3}
O	{KEm: 1}{KE: 2}	{K: 3, E: 3}
E	{K: 4}	{K: 4}

Step: 6

item	Conditional Pattern Base	Conditional FP-tree	Frequent Pattern Generated
Y	{KEmo:1}{KEO:1}{Km:1}	{K: 3}	{K, y: 3}
O	{KEm:1} {KE: 2}	{K:3, E:3}	{K,O:3}{E,O:3}{KEO: 3}
m	{KE:2} {K: 1}	{K: 3}	{K, m: 3}
E	{K: 4}	{K: 4}	{K, E: 4}
K	—	—	

Example: 2

TIO	items
1	1 2 5
2	2 4
3	2 3
4	1 2 4
5	1 3
6	2 3
7	1 3
8	1 2 3 5
9	1 2 5

Solution

Item	count
1	6
2	7
3	6
4	2
5	2

Step: 2 $\{2:7, 1:6, 3:6, 4:2, 5:2\}$

TIO	items
1	2 1 5
2	2 4
3	2 3
4	2 1 4
5	1 3
6	2 3
7	1 3
8	2 1 3 5
9	2 1 3

Step - 3

```
        null
         |
      2 : 1
         |
      1 : 1
         |
      5 : 1


        null
         |
      2 : 2
       /    \
    1 : 1   4 : 1
      |
    5 : 1


        null
         |
      2 : 3
      /  |   \
   1:1  4:1  3:1
    |
   5 : 1
```

```
          null
        /        \
     2 : 4       1 : 1
       |           |
     1 : 2   4:1 3:1 3:1
     /   \
   5 : 1  4 : 1
```

```
          null
        /        \
     2 : 5       1 : 1
       |           |
     1 : 2   4:1 3:2 3:1
     /   \
   5 : 1  4 : 1
```

```
          null
        /        \
     2 : 5       1 : 2
       |           |
     1 : 2   4:1 3:2 3:2
     /   \
   5 : 1  4 : 1
```

```
                        null
            2 : 6                           1 : 2
                
        1 : 3         4 : 1   3 : 2      3 : 2

    5 : 1      3 : 1      4 : 1

            5 : 1
```

```
                        null
            2 : 7                           1 : 2

        1 : 4         4 : 1   3 : 2      3 : 2

    5 : 1      3 : 2      4 : 1

            5 : 1
```
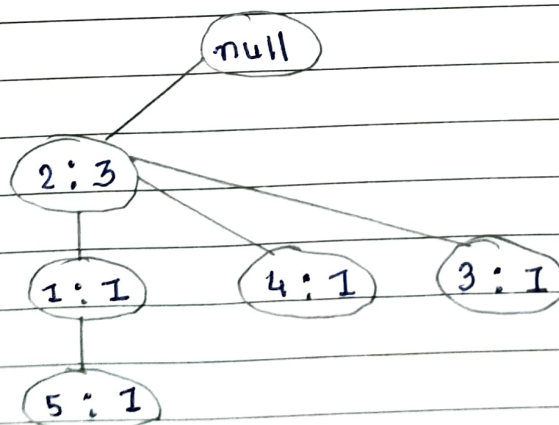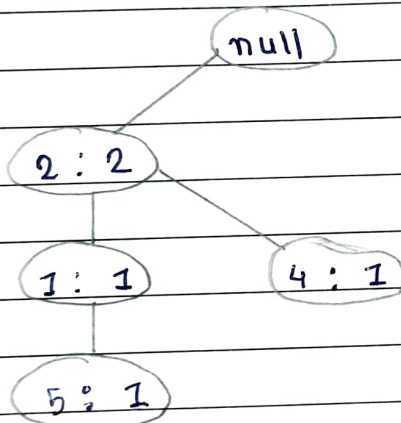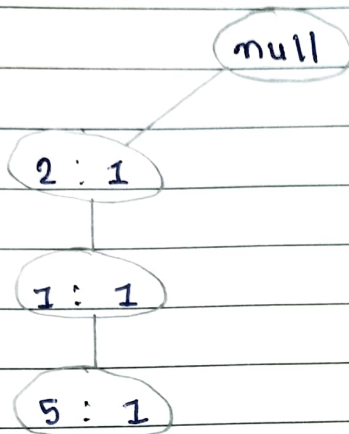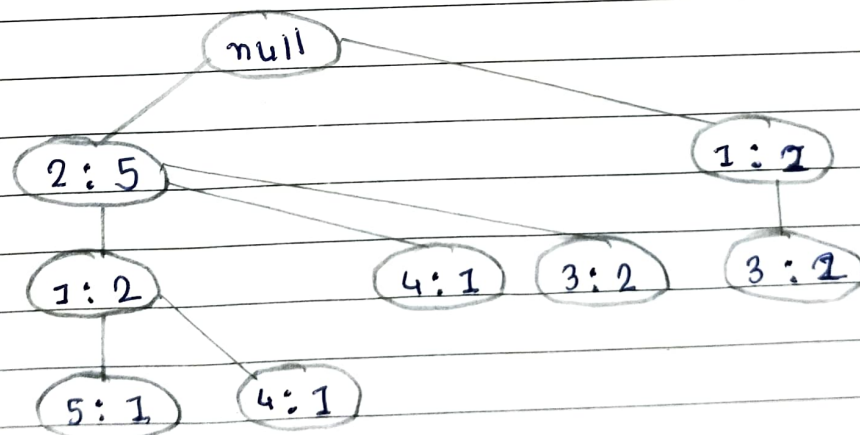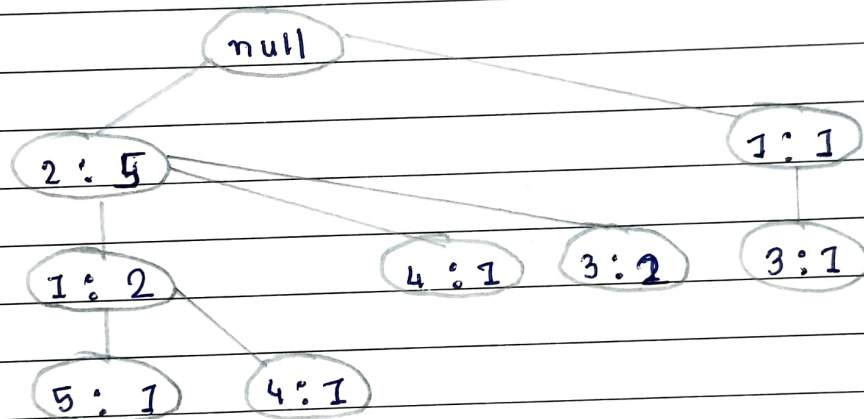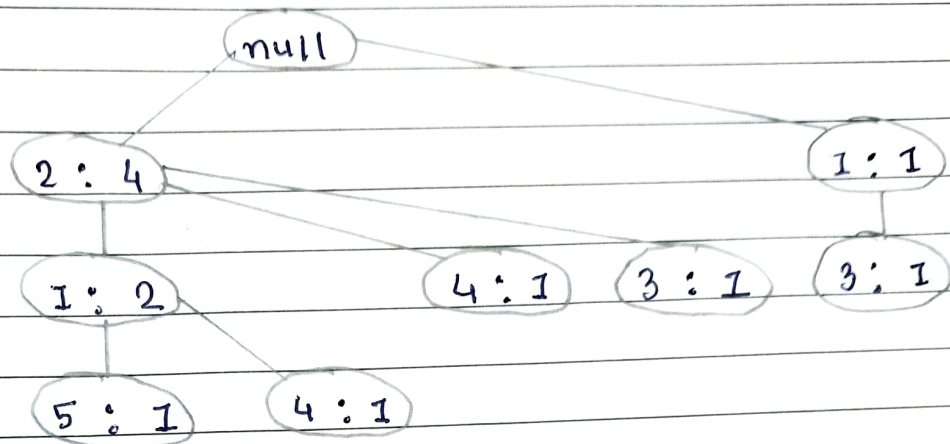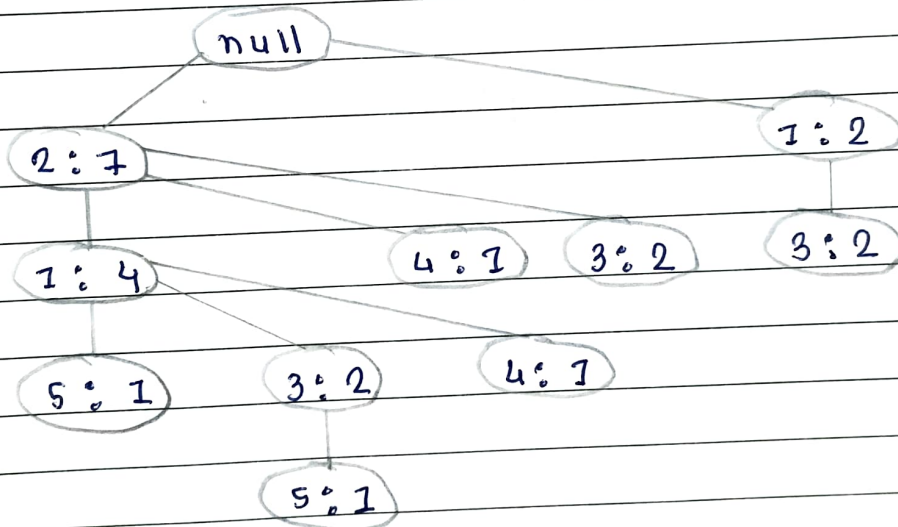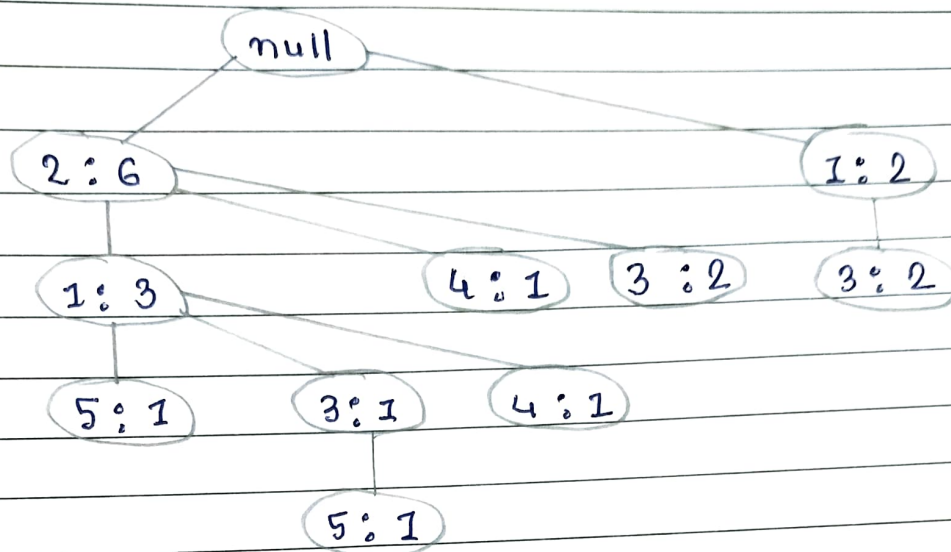
step-4	item	conditional Pattern Base
	5	{2 1 : 1} {2 1 3 : 1}
	4	{2 : 1} {2 1 : 1}
	3	{2 1 : 2} {2 : 2} {1 : 2}
	1	{2 : 4}
	2	-

Step-5	items	conditional Pattern Base	conditional FP-Tree	
	5	{21:1} {213:1}	{2:1, 1:1}	
	4	{2:1} {21:1}	{2:1}	
	3	{21:2} {2:2} {1:2}	{2:4}	
	1	{2:4}	{2:4}	
	2	-	-	

Step-6	items	conditional Pattern Base	conditional FP-tree	Frequent Pattern Generated
	5	{21:1} {213:1}	{2:1, 1:1}	{2 5:1} {1 5:1}
	4	{2:1} {21:1}	{2:1}	{2.4:1}
	3	{21:2} {2:2} {1:2}	{2:4}	{2.3:4}
	1	{2:4}	{2:4}	{2.1:4}
	2	-	-	-