1a) Using the market basket data from TSK Table 6.1, and the frequent itemsets in TSK Fig 6.5, find the support and confidence of all 1-consequent association rules generated by the frequent itemsets in Fig. 6.5. Order the rules in the table below by lexicographical order of antecedent, then consequent.

Antecedents	Consequent	Support	Confidence

1b.) Generate all frequent 2-consequents association rules, and list their supports and confidences as in 1.a.

Antecedents	Consequents	Support	Confidence

1c) List all association rules generated in 1a) and 1b) with minimum support of 3 and minimum confidence of 9/10.

Antecedents	Consequents	Support	Confidence

TSK 6.2

(a.) $\sigma(\{e\}) =$

$\sigma(\{bd\}) =$

$\sigma(\{bde\}) =$

(b.)

c.) Merging baskets by customer id, we get

d.)

e.)

TSK 6.6

(a.) The following basket items appear in lexicographical order:

(b.)

(c.)

(d.) It suffices to consider all 2-itemsets (why?)

An itemset with maximum support is

e.) $c(\{a\} \rightarrow \{b\}) = c(\{b\} \rightarrow \{a\})$ when

TSK 6.7

(a.)

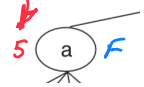
(b.) Using the $F_3 \times F_3$ method and ignoring duplicates, we get

6.7 c.) $f \in C_4$ survives pruning if all 3-subsets are frequent

TSK 6.8

(a) min sup = 30% ≥ 3 transaction. is frequent.

support



Transaction ID	Items Bought
1	$\{a, b, d, e\}$
2	$\{b, c, d\}$
3	$\{a, b, d, e\}$
4	$\{a, c, d, e\}$
5	$\{b, c, d, e\}$
6	$\{b, d, e\}$
7	$\{c, d\}$
8	$\{a, b, c\}$
9	$\{a, d, e\}$
10	$\{b, d\}$

b.)

c.)

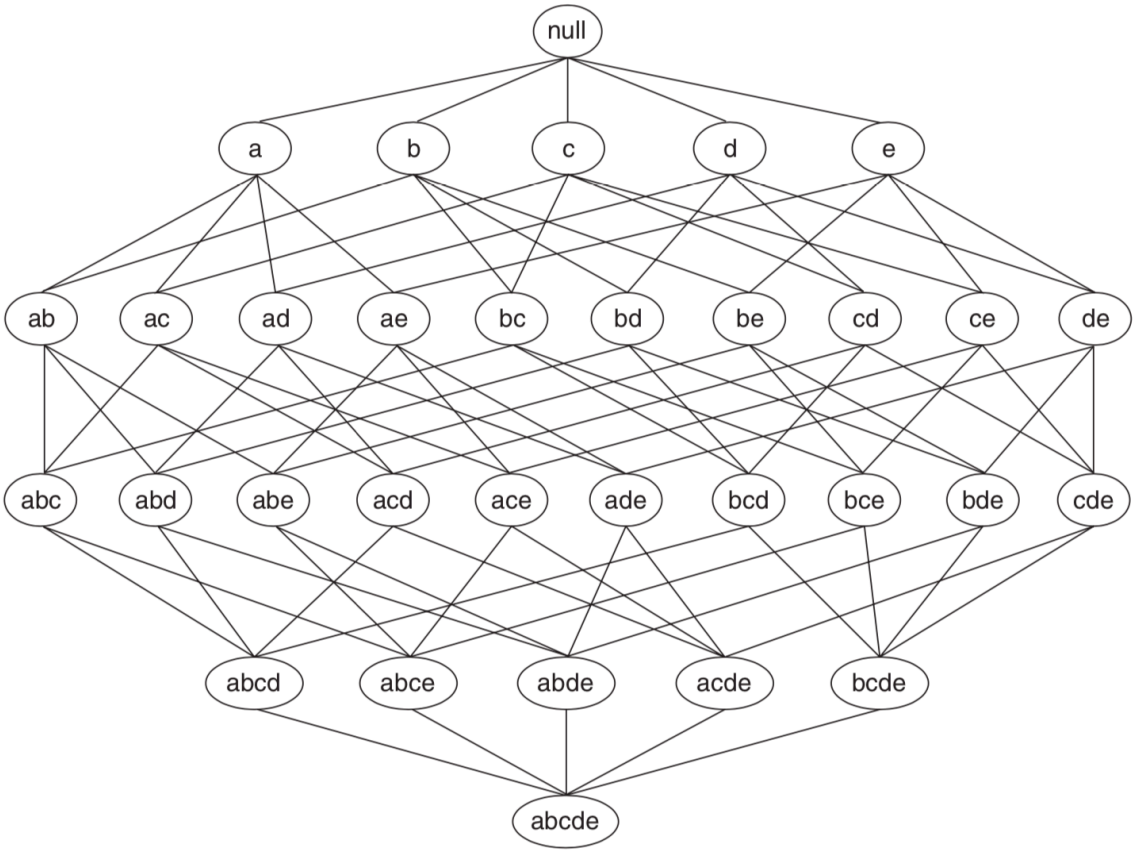
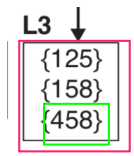


Figure 6.33. An itemset lattice

TSK 6.9

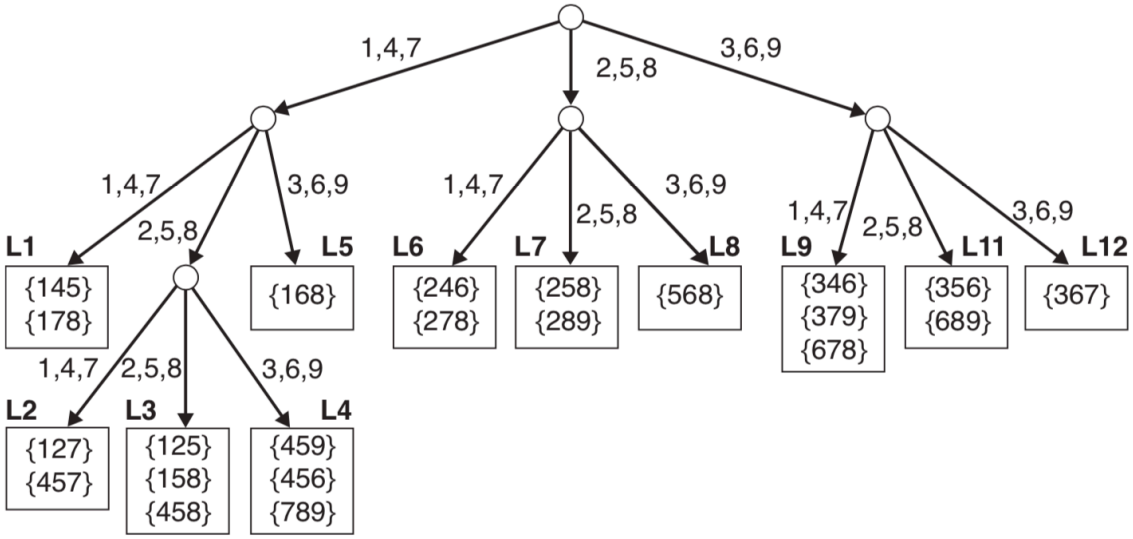
(a)

{1, 3, 4, 5 8}



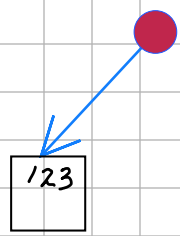
b. = leaf node visited

= candidate itemset


1,4,7
2,5,8
3,6,9
1,4,7
2,5,8
3,6,9
1,4,7
2,5,8
3,6,9
1,4,7
2,5,8
3,6,9
L1
{145}
{178}
L5
{168}
L6
{246}
{278}
L7
{258}
{289}
L8
{568}
L9
{346}
{379}
{678}
L11
{356}
{689}
L12
{367}
1,4,7
2,5,8
3,6,9
L2
{127}
{457}
L3
{125}
{158}
{458}
L4
{459}
{456}
{789}

TSK 6.10 maxsize = 2

(a.) hash tree after {1,2,3}



hash tree after {1,2,3}, {1,2,6}

hash tree after {1,2,3}, {1,2,6}, {1,3,4}

hash tree after {1,2,3}, {1,2,6}, {1,3,4}, {2,3,4}

hash tree after {1,2,3}, {1,2,6}, {1,3,4}, {2,3,4}, {2,4,5}

hash tree after {1,2,3}, {1,2,6}, {1,3,4}, {2,3,4}, {2,4,5}, {3,4,6}

hash tree after {1,2,3}, {1,2,6}, {1,3,4}, {2,3,4}, {2,4,5}, {3,4,6}, {4,5,6}

b.) There are internal nodes and leaf nodes.

c)

= leaf node

= visited leaf node

= matching candidate itemset

TSK 6.11

(a) min sup = 30% ≥ 3 transaction. is frequent.

Transaction ID	Items Bought
1	$\{a, b, d, e\}$
2	$\{b, c, d\}$
3	$\{a, b, d, e\}$
4	$\{a, c, d, e\}$
5	$\{b, c, d, e\}$
6	$\{b, d, e\}$
7	$\{c, d\}$
8	$\{a, b, c\}$
9	$\{a, d, e\}$
10	$\{b, d\}$

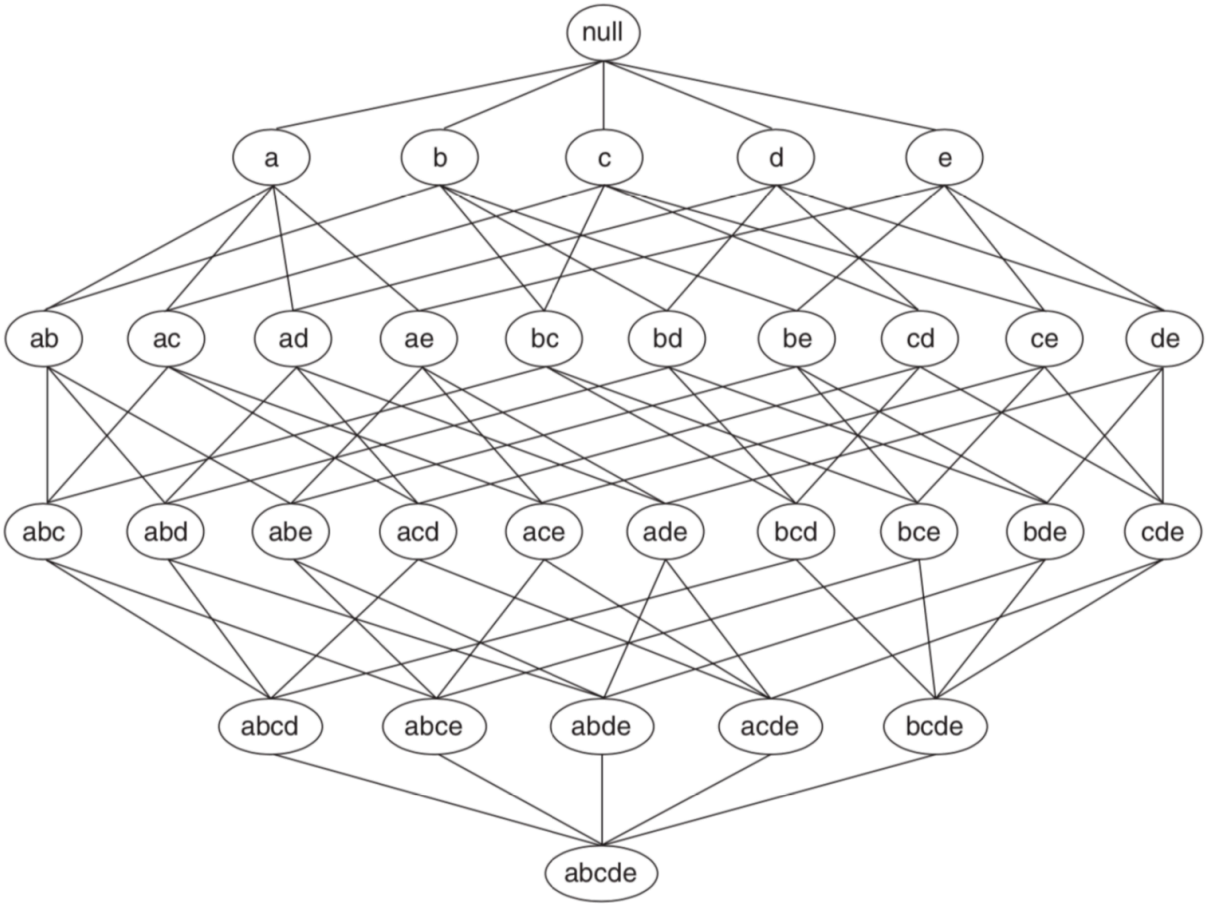


Figure 6.33. An itemset lattice