Exercise – 1:

TID	*Items*
1	**Bread, Milk**
2	**Bread, Diaper, Beer, Eggs**
3	**Milk, Diaper, Beer, Coke**
4	**Bread, Milk, Diaper, Beer**
5	**Bread, Milk, Diaper, Coke**

Minsup=0.1

{Bread, Milk, Diaper} → 3-itemset → frequent itemsets.

2-itemsets: {Bread, Milk} – 3/5 = 0.6;
{Bread, Diaper} – 3/5 = 0.6;
{Milk, Diaper} – 3/5 = 0.6

1-itemsets: {Bread} – 4/5 = 0.8;
{Milk} – 4/5 =0.8;
{Diaper} – 4/5 = 0.8

All the frequent itemsets will be candidate itemsets but not all candidate itemsets will be not be frequent itemsets.

Exercise-1:

Transaction 1	**Apple, beer, rice, chicken**
Transaction 2	**Apple, beer, rice**
Transaction 3	**Apple, beer**
Transaction 4	**Milk, beer, rice, chicken**
Transaction 5	**Milk, beer, rice**
Transaction 6	**Milk, beer**

Minsup=0.2

Unique items: Apple, Beer, Rice, Chicken, Milk

Green highlight – frequent itemsets; Red highlight – only a candidate itemsets not frequent.

1-itemset:

{Apple}-3/6 = 0.5
{Beer}-6/6 = 1.0
{Rice}-4/6 = 0.67
{Chicken}-2/6 = 0.34
{Milk}-3/6 = 0.5

2-itemset

{Apple, Beer} –3/6 = 0.5
{Apple, Rice} – 2/6 = 0.34
{Apple, Chicken} – 1/6 = 0.16
{Apple, Milk} -- 0
{Beer, Rice} – 4/6 = 0.67
{Beer, Chicken} – 2/6 = 0.34
{Beer, Milk} – 3/6 = 0.5
{Rice, Chicken} – 2/6 = 0.34
{Rice, Milk} – 2/6 = 0.34
{Chicken, Milk} – 1/6 = 0.16

3-itemsets:

{Apple, Rice, Beer} – 2/6 = 0.34
{Apple, Beer, Chicken} --
{Apple, Beer, Milk} --
{Rice, Chicken, Milk} --
{Beer, Milk, Rice} – 2/6 = 0.34
{Apple, Rice, Milk} --
{Apple, Rice, Chicken} --
{Beer, Chicken, Rice} – 2/6 = 0.34

4-itemsets:

{Apple, Rice, Beer, Milk} =
{Beer, Milk, Chicken, Rice} =
{Apple, Beer, Rice, Chicken} =

Frequently occurring itemsets – 15

Exercise – 2

Transaction 1	**a, b, e**
Transaction 2	**b, d**
Transaction 3	**b, c**
Transaction 4	**a, b, d**
Transaction 5	**a, c**
Transaction 6	**b, c**
Transaction 7	**a, c**
Transaction 8	**a, b, c, e**
Transaction 9	**a, b, c**

Minsup =0.2

Unique items: a, b, c, d, e

1-itemsets

{a}= 6/9 =0.67
{b}=7/9 = 0.77
{c}=6/9 =0.67
{d}=2/9 = 0.22
{e}=2/9 = 0.22

2-itemsets

{a,b}=0.44
{a,c}=0.44
{a,d}=0.11
{a,e}=0.22
{b,c}=0.44
{b,d}=0.22
{b,e}=0.22
{c,d}=0
{c,e}=0.11
{d,e}=0

3-itemsets

{a,b,c}=2/9 =0.22
{a,b,e}=2/9=0.22

{a}=> {b,c} support; confidence=
{a,b}=>{c}
{b}=>{a,c}
{b,c}=>{a}
{c}=>{a,b}
{a,c}=>{b}

4-itemsets

Now computing the support, confidence and lift values for the rules.

Transaction ID	Items
T1	**A, B, C**
T2	**A, C, D**
T3	**B, C, D**
T4	**A, D, E**
T5	**B, C, E**

C=>A

Support: freq(C,A)/#Transactions = 2/5
Confidence: freq(C,A)/freq(C) = 2/4 = 0.5
Lift: support/support(C)*support(A)
support = 2/5
Support(C)*Support(A) = 4/5 * 3/5 = 12/25

Lift = 2/5 * 25/12 = 5/6

A=>C

Support: 2/5
Confidence: freq(C,A)/freq(A) = 2/3 = 0.67
Lift: support/support(A)*support(C) = (2/5)/(3/5)*(4/5) = 5/6

{B, C} => {D}

Support = 1/5; Confidence = 1/3; Lift = 5/9

Lift = Support/support(B,C)*support(D)

Support: 1/5

Support(B,C) = 3/5

Support(D) = 3/5

1/5 / (3/5 * 3/5) = (1/5) / (9/25) = 5/9