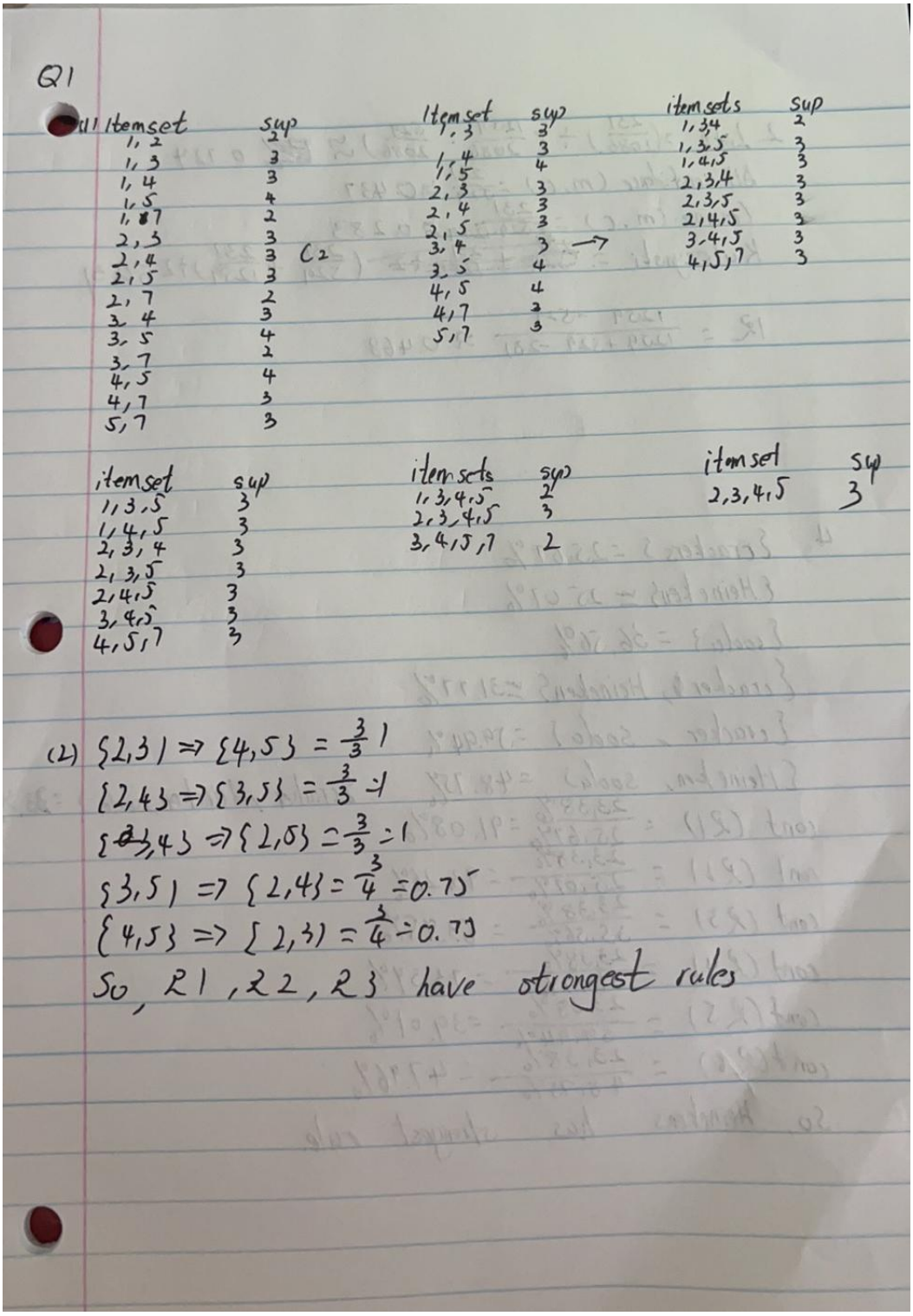
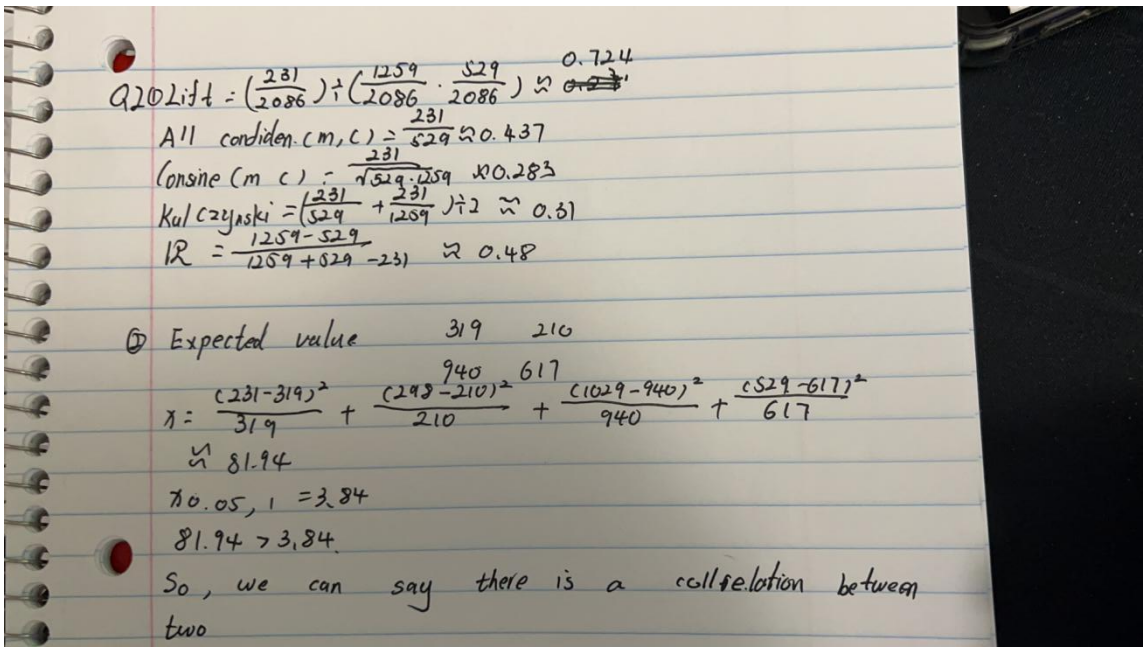
Q1


Q1
(1)
itemset sup
1,2 2
1,3 3
1,4 3
1,5 4
1,7 2
2,3 3
2,4 3
2,5 3
2,7 2
3,4 3
3,5 4
3,7 2
4,5 4
4,7 3
5,7 3
C2
itemset sup
1,3 3
1,4 3
1,5 4
2,3 3
2,4 3
2,5 3
3,4 3
3,5 4
4,5 4
4,7 2
5,7 3
itemsets sup
1,3,4 2
1,3,5 3
1,4,5 3
2,3,4 3
2,3,5 3
2,4,5 3
3,4,5 3
4,5,7 3
itemset sup
1,3,5 3
1,4,5 3
2,3,4 3
2,3,5 3
2,4,5 3
3,4,5 3
4,5,7 3
itemsets sup
1,3,4,5 2
2,3,4,5 3
3,4,5,7 2
itemset sup
2,3,4,5 3
(2) {2,3} => {4,5} = 3/3 = 1
{2,4} => {3,5} = 3/3 = 1
{3,4} => {2,5} = 3/3 = 1
{3,5} => {2,4} = 3/4 = 0.75
{4,5} => {2,3} = 3/4 = 0.75
So, 21, 22, 23 have strongest rules

Q2



Q3

Input

10 30 -1 80 -1 -2

10 -1 30 40 -1 60 70 80 -1 -2

30 40 50 -1 70 80 -1 -2

70 -1 20 30 -1 60 80 -1 -2

10 20 -1 30 -1 40 70 -1 80 -1 -2

Output

80 -1 #SUP: 5

20 -1 #SUP: 2

20 -1 80 -1 #SUP: 2

70 -1 #SUP: 4

70 80 -1 #SUP: 2

70 -1 80 -1 #SUP: 2

40 -1 #SUP: 3

40 -1 80 -1 #SUP: 3

40 -1 70 -1 #SUP: 2

40 -1 70 80 -1 #SUP: 2

10 -1 #SUP: 3

10 -1 80 -1 #SUP: 3

10 -1 70 -1 #SUP: 2

10 -1 40 -1 #SUP: 2

10 -1 40 -1 80 -1 #SUP: 2

10 -1 30 -1 #SUP: 2

10 -1 30 -1 80 -1 #SUP: 2

10 -1 30 -1 70 -1 #SUP: 2
60 -1 #SUP: 2
60 80 -1 #SUP: 2
30 -1 #SUP: 5
30 40 -1 #SUP: 2
30 40 -1 80 -1 #SUP: 2
30 40 -1 70 -1 #SUP: 2
30 40 -1 70 80 -1 #SUP: 2
30 -1 80 -1 #SUP: 5
30 -1 70 -1 #SUP: 3
30 -1 70 80 -1 #SUP: 2
30 -1 60 -1 #SUP: 2
30 -1 60 80 -1 #SUP: 2

Q4

规则

规则			
条件	结果	置信度	提升度
artichoke, avocado	Heineken	94%	1.573
crackers, soda	Heineken	93%	1.555
Heineken, soda	crackers	91%	1.868
baguette, herring	Heineken	86%	1.434
corned beef, olives	herring	85%	1.755
artichoke	Heineken	83%	1.378
corned beef, herring	olives	82%	1.745
baguette, Heineken	herring	82%	1.689
crackers, herring	Heineken	81%	1.353
soda	Heineken	81%	1.348
avocado, Heineken	artichoke	80%	2.623
artichoke, Heineken	avocado	79%	2.178
soda	crackers	79%	1.619
herring, olives	corned beef	79%	2.02
turkey	olives	78%	1.653
crackers	Heineken	75%	1.251
Coke	ice cream	74%	2.377
Heineken, herring	baguette	74%	1.897
soda	crackers, Heineken	74%	2.013
bourbon, Heineken	crackers	72%	1.475
ice cream	Coke	70%	2.377

规则			
条件	结果	置信度	提升度
apples	corned beef	48%	123%
corned beef	apples	39%	123%
artichoke	avocado	69%	191%
avocado	artichoke	58%	191%
artichoke	Heineken	83%	138%
Heineken	artichoke	42%	138%
avocado	baguette	59%	151%
baguette	avocado	55%	151%
baguette	herring	64%	131%
herring	baguette	51%	131%
baguette	soda	39%	123%
soda	baguette	48%	123%
bourbon	crackers	60%	122%
crackers	bourbon	49%	122%
bourbon	olives	61%	129%
olives	bourbon	52%	129%
bourbon	peppers	38%	129%
peppers	bourbon	52%	129%
bourbon	soda	38%	121%
soda	bourbon	49%	121%
Coke	ice cream	74%	238%
ice cream	Coke	70%	238%
corned beef	ham	41%	134%
ham	corned beef	52%	134%
corned beef	herring	63%	129%
herring	corned beef	50%	129%
corned beef	olives	61%	128%
olives	corned beef	50%	128%
crackers	Heineken	75%	125%
Heineken	crackers	61%	125%
crackers	soda	51%	162%
soda	crackers	79%	162%
Heineken	soda	43%	135%
soda	Heineken	81%	135%
ice cream	sardines	48%	163%

4 {crackers} = 25.67%

{Heinekens} = 25.07%

{soda} = 36.56%

{crackers, Heinekens} = 31.77%

{cracker, soda} = 59.94%

{Heineken, soda} = 48.75% {cracker, Heineken, soda} = 23.38%

conf (R1) = $\frac{23.38\%}{25.67\%}$ = 91.08%

conf (R2) = $\frac{23.38\%}{25.07\%}$ = 93.26%

conf (R3) = $\frac{23.38\%}{35.56\%}$ = 63.98%

conf (R4) = $\frac{23.38\%}{31.77\%}$ = 73.59%

conf (R5) = $\frac{23.38\%}{59.94\%}$ = 39.01%

conf (R6) = $\frac{23.38\%}{48.75\%}$ = 47.96%

So, { Heinekens has strongest rule.
{ crackers
{ crackers, Heineken