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CSE 494: AI for Cyber Security  
Shakarian - Friday 1 pm  
March 15th, 2019

## CSE 494 Lab 5 Exercises

### 1. Frequent item support with support $\geq 7\%$ :

support	itemsets	length			
0 0.071429	(4 TRADITIONAL SPINNING TOPS)	1			
1 0.096939	(ALARM CLOCK BAKELIKE GREEN)	1			
2 0.102041	(ALARM CLOCK BAKELIKE PINK)	1			
3 0.094388	(ALARM CLOCK BAKELIKE RED)	1			
4 0.081633	(BAKING SET 9 PIECE RETROSPOT)	1			
5 0.071429	(CHILDRENS CUTLERY DOLLY GIRL)	1			
6 0.099490	(DOLLY GIRL LUNCH BOX)	1			
7 0.096939	(JUMBO BAG RED RETROSPOT)	1			
8 0.076531	(JUMBO BAG WOODLAND ANIMALS)	1			
9 0.125000	(LUNCH BAG APPLE DESIGN)	1			
10 0.084184	(LUNCH BAG DOLLY GIRL DESIGN)	1			
11 0.153061	(LUNCH BAG RED RETROSPOT)	1			
12 0.119898	(LUNCH BAG SPACEBOY DESIGN)	1			
13 0.117347	(LUNCH BAG WOODLAND)	1			
14 0.142857	(LUNCH BOX WITH CUTLERY RETROSPOT)	1			
15 0.104592	(MINI PAINT SET VINTAGE)	1			
16 0.102041	(PACK OF 72 RETROSPOT CAKE CASES)	1			
17 0.081633	(PAPER BUNTING RETROSPOT)	1			
18 0.168367	(PLASTERS IN TIN CIRCUS PARADE)	1			
19 0.137755	(PLASTERS IN TIN SPACEBOY)	1			
20 0.081633	(PLASTERS IN TIN STRONGMAN)	1			
21 0.170918	(PLASTERS IN TIN WOODLAND ANIMALS)	1			
22 0.188776	(RABBIT NIGHT LIGHT)	1			
23 0.096939	(RED RETROSPOT CHARLOTTE BAG)	1			
24 0.137755	(RED RETROSPOT MINI CASES)	1			
25 0.071429	(RED RETROSPOT PICNIC BAG)	1			
26 0.181122	(RED TOADSTOOL LED NIGHT LIGHT)	1			
27 0.125000	(REGENCY CAKESTAND 3 TIER)	1			
28 0.086735	(RETROSPOT TEA SET CERAMIC 11 PC)	1			
29 0.107143	(ROUND SNACK BOXES SET OF 4 FRUITS)	1			
30 0.158163	(ROUND SNACK BOXES SET OF 4 WOODLAND)	1			
31 0.076531	(SET/10 RED POLKADOT PARTY CANDLES)	1			
32 0.132653	(SET/20 RED RETROSPOT PAPER NAPKINS)	1			
33 0.137755	(SET/6 RED SPOTTY PAPER CUPS)	1			
34 0.127551	(SET/6 RED SPOTTY PAPER PLATES)	1			
35 0.071429	(SPACEBOY BIRTHDAY CARD)	1			
36 0.125000	(SPACEBOY LUNCH BOX)	1			
37 0.122449	(STRAWBERRY LUNCH BOX WITH CUTLERY)	1			
38 0.094388	(TEA PARTY BIRTHDAY CARD)	1			
39 0.073980	(WOODLAND CHARLOTTE BAG)	1			
40 0.073980	(ALARM CLOCK BAKELIKE GREEN, ALARM CLOCK BAKELIK...	2			
41 0.079082	(ALARM CLOCK BAKELIKE RED, ALARM CLOCK BAKELIK...	2			
42 0.073980	(ALARM CLOCK BAKELIKE RED, ALARM CLOCK BAKELIK...	2			
43 0.071429	(DOLLY GIRL LUNCH BOX, SPACEBOY LUNCH BOX)	2			
44 0.089286	(PLASTERS IN TIN CIRCUS PARADE, PLASTERS IN TI...	2			
45 0.102041	(PLASTERS IN TIN CIRCUS PARADE, PLASTERS IN TI...	2			
46 0.104592	(PLASTERS IN TIN WOODLAND ANIMALS, PLASTERS IN...	2			
47 0.102041	(SET/6 RED SPOTTY PAPER CUPS, SET/20 RED RETRO...	2			
48 0.102041	(SET/6 RED SPOTTY PAPER PLATES, SET/20 RED RET...	2			
49 0.122449	(SET/6 RED SPOTTY PAPER PLATES, SET/6 RED SPOT...	2			
50 0.099490	(SET/6 RED SPOTTY PAPER PLATES, SET/6 RED SPOT...	3			

## 2. Association rules with confidence $\geq 50\%$ :

	antecedents	consequents	antecedent support	consequent support	support	confidence	lift	leverage	conviction
0	(PLASTERS IN TIN WOODLAND ANIMALS)	(PLASTERS IN TIN SPACEBOY)	0.170918	0.137755	0.104592	0.611940	4.442233	0.081047	2.221939
1	(PLASTERS IN TIN SPACEBOY)	(PLASTERS IN TIN WOODLAND ANIMALS)	0.137755	0.170918	0.104592	0.759259	4.442233	0.081047	3.443878
2	(SET/6 RED SPOTTY PAPER CUPS)	(SET/20 RED RETROSPOT PAPER NAPKINS)	0.137755	0.132653	0.102041	0.740741	5.584046	0.083767	3.345481
3	(SET/20 RED RETROSPOT PAPER NAPKINS)	(SET/6 RED SPOTTY PAPER CUPS)	0.132653	0.137755	0.102041	0.769231	5.584046	0.083767	3.736395
4	(SET/6 RED SPOTTY PAPER PLATES, SET/6 RED SPOT...	(SET/20 RED RETROSPOT PAPER NAPKINS)	0.122449	0.132653	0.099490	0.812500	6.125000	0.083247	4.625850
5	(SET/6 RED SPOTTY PAPER PLATES, SET/20 RED RET...	(SET/6 RED SPOTTY PAPER CUPS)	0.102041	0.137755	0.099490	0.975000	7.077778	0.085433	34.489796
6	(SET/6 RED SPOTTY PAPER CUPS, SET/20 RED RETRO...	(SET/6 RED SPOTTY PAPER PLATES)	0.102041	0.127551	0.099490	0.975000	7.644000	0.086474	34.897959
7	(SET/6 RED SPOTTY PAPER PLATES)	(SET/6 RED SPOTTY PAPER CUPS, SET/20 RED RETRO...	0.127551	0.102041	0.099490	0.780000	7.644000	0.086474	4.081633
8	(SET/6 RED SPOTTY PAPER CUPS)	(SET/6 RED SPOTTY PAPER PLATES, SET/20 RED RET...	0.137755	0.102041	0.099490	0.722222	7.077778	0.085433	3.232653
9	(SET/20 RED RETROSPOT PAPER NAPKINS)	(SET/6 RED SPOTTY PAPER PLATES, SET/6 RED SPOT...	0.132653	0.122449	0.099490	0.750000	6.125000	0.083247	3.510204
10	(SET/6 RED SPOTTY PAPER PLATES)	(SET/6 RED SPOTTY PAPER CUPS)	0.127551	0.137755	0.122449	0.960000	6.968889	0.104878	21.556122
11	(SET/6 RED SPOTTY PAPER CUPS)	(SET/6 RED SPOTTY PAPER PLATES)	0.137755	0.127551	0.122449	0.888889	6.968889	0.104878	7.852041
12	(PLASTERS IN TIN CIRCUS PARADE)	(PLASTERS IN TIN SPACEBOY)	0.168367	0.137755	0.089286	0.530303	3.849607	0.066092	1.835747
13	(PLASTERS IN TIN SPACEBOY)	(PLASTERS IN TIN CIRCUS PARADE)	0.137755	0.168367	0.089286	0.648148	3.849607	0.066092	2.363588
14	(DOLLY GIRL LUNCH BOX)	(SPACEBOY LUNCH BOX)	0.099490	0.125000	0.071429	0.717949	5.743590	0.058992	3.102273
15	(SPACEBOY LUNCH BOX)	(DOLLY GIRL LUNCH BOX)	0.125000	0.099490	0.071429	0.571429	5.743590	0.058992	2.101190
16	(PLASTERS IN TIN CIRCUS PARADE)	(PLASTERS IN TIN WOODLAND ANIMALS)	0.168367	0.170918	0.102041	0.606061	3.545907	0.073264	2.104592
17	(PLASTERS IN TIN WOODLAND ANIMALS)	(PLASTERS IN TIN CIRCUS PARADE)	0.170918	0.168367	0.102041	0.597015	3.545907	0.073264	2.063681
18	(SET/6 RED SPOTTY PAPER PLATES)	(SET/20 RED RETROSPOT PAPER NAPKINS)	0.127551	0.132653	0.102041	0.800000	6.030769	0.085121	4.336735
19	(SET/20 RED RETROSPOT PAPER NAPKINS)	(SET/6 RED SPOTTY PAPER PLATES)	0.132653	0.127551	0.102041	0.769231	6.030769	0.085121	3.780612
20	(ALARM CLOCK BAKELIKE RED)	(ALARM CLOCK BAKELIKE GREEN)	0.094388	0.096939	0.079082	0.837838	8.642959	0.069932	5.568878
21	(ALARM CLOCK BAKELIKE GREEN)	(ALARM CLOCK BAKELIKE RED)	0.096939	0.094388	0.079082	0.815789	8.642959	0.069932	4.916181
22	(ALARM CLOCK BAKELIKE RED)	(ALARM CLOCK BAKELIKE PINK)	0.094388	0.102041	0.073980	0.783784	7.681081	0.064348	4.153061
23	(ALARM CLOCK BAKELIKE PINK)	(ALARM CLOCK BAKELIKE RED)	0.102041	0.094388	0.073980	0.725000	7.681081	0.064348	3.293135
24	(ALARM CLOCK BAKELIKE GREEN)	(ALARM CLOCK BAKELIKE PINK)	0.096939	0.102041	0.073980	0.763158	7.478947	0.064088	3.791383
25	(ALARM CLOCK BAKELIKE PINK)	(ALARM CLOCK BAKELIKE GREEN)	0.102041	0.096939	0.073980	0.725000	7.478947	0.064088	3.283859

### 3. Rules with support > 10%:

	antecedents	consequents	antecedent support	consequent support	support	confidence	lift	leverage	conviction
0	(PLASTERS IN TIN WOODLAND ANIMALS)	(PLASTERS IN TIN SPACEBOY)	0.170918	0.137755	0.104592	0.611940	4.442233	0.081047	2.221939
1	(PLASTERS IN TIN SPACEBOY)	(PLASTERS IN TIN WOODLAND ANIMALS)	0.137755	0.170918	0.104592	0.759259	4.442233	0.081047	3.443878
2	(SET/6 RED SPOTTY PAPER CUPS)	(SET/20 RED RETROSPOT PAPER NAPKINS)	0.137755	0.132653	0.102041	0.740741	5.584046	0.083767	3.345481
3	(SET/20 RED RETROSPOT PAPER NAPKINS)	(SET/6 RED SPOTTY PAPER CUPS)	0.132653	0.137755	0.102041	0.769231	5.584046	0.083767	3.736395
10	(SET/6 RED SPOTTY PAPER PLATES)	(SET/6 RED SPOTTY PAPER CUPS)	0.127551	0.137755	0.122449	0.960000	6.968889	0.104878	21.556122
11	(SET/6 RED SPOTTY PAPER CUPS)	(SET/6 RED SPOTTY PAPER PLATES)	0.137755	0.127551	0.122449	0.888889	6.968889	0.104878	7.852041
16	(PLASTERS IN TIN CIRCUS PARADE)	(PLASTERS IN TIN WOODLAND ANIMALS)	0.168367	0.170918	0.102041	0.606061	3.545907	0.073264	2.104592
17	(PLASTERS IN TIN WOODLAND ANIMALS)	(PLASTERS IN TIN CIRCUS PARADE)	0.170918	0.168367	0.102041	0.597015	3.545907	0.073264	2.063681
18	(SET/6 RED SPOTTY PAPER PLATES)	(SET/20 RED RETROSPOT PAPER NAPKINS)	0.127551	0.132653	0.102041	0.800000	6.030769	0.085121	4.336735
19	(SET/20 RED RETROSPOT PAPER NAPKINS)	(SET/6 RED SPOTTY PAPER PLATES)	0.132653	0.127551	0.102041	0.769231	6.030769	0.085121	3.780612

### 4. Alarm Clock Bakelike Green Sold: **340**.