Phase 3 – AI Development Part 1

The apriori algorithm is imported to the program by using the mlxtend library. Once it's imported we establish the association rules for the data present in the dataset. We use a minimum threshold of 0.5% and create the association rules. The association rules are created with the frequent itemsets that is first found and this data is presented below.

```
Frequent Itemsets:
        support                                         itemsets
0      0.017370                       (10 COLOUR SPACEBOY PEN)
1      0.013751               (12 MESSAGE CARDS WITH ENVELOPES)
2      0.019653                     (12 PENCIL SMALL TUBE WOODLAND)
3      0.019820              (12 PENCILS SMALL TUBE RED RETROSPOT)
4      0.019597                      (12 PENCILS SMALL TUBE SKULL)
...         ...                                              ...
2467   0.010355   (LUNCH BAG RED RETROSPOT, LUNCH BAG SUKI DESIG...
2468   0.010188   (LUNCH BAG RED RETROSPOT, LUNCH BAG SUKI DESIG...
2469   0.010300   (LUNCH BAG RED RETROSPOT, LUNCH BAG SPACEBOY D...
2470   0.010467   (LUNCH BAG RED RETROSPOT, LUNCH BAG PINK POLKA...
2471   0.011302   (CHARLOTTE BAG PINK POLKADOT, STRAWBERRY CHARL...

[2472 rows x 2 columns]
```

Association Rules:

	antecedents	consequents	antecedent support	consequent support	support	confidence	lift	leverage	conviction	zhangs_metric
0	(60 CAKE CASES DOLLY GIRL DESIGN)	(PACK OF 72 RETROSPOT CAKE CASES)	0.023160	0.071206	0.013028	0.562500	7.899629	0.011378	2.122958	0.894120
1	(60 TEATIME FAIRY CAKE CASES)	(PACK OF 72 RETROSPOT CAKE CASES)	0.044427	0.071206	0.024218	0.545113	7.655446	0.021054	2.041812	0.909794
2	(ALARM CLOCK BAKELIKE CHOCOLATE)	(ALARM CLOCK BAKELIKE GREEN)	0.023216	0.053558	0.015254	0.657074	12.268575	0.014011	2.759906	0.940321
3	(ALARM CLOCK BAKELIKE CHOCOLATE)	(ALARM CLOCK BAKELIKE PINK)	0.023216	0.042256	0.011691	0.503597	11.917802	0.010710	1.929369	0.937865
4	(ALARM CLOCK BAKELIKE CHOCOLATE)	(ALARM CLOCK BAKELIKE RED)	0.023216	0.057121	0.015811	0.681055	11.923112	0.014485	2.956246	0.937903
...	...	...	...	...	...	...	...	...	...	...
1392	(CHARLOTTE BAG SUKI DESIGN, STRAWBERRY CHARLOT...	(CHARLOTTE BAG PINK POLKADOT, WOODLAND CHARLOT...	0.018483	0.021824	0.011302	0.611446	28.017319	0.010898	2.517477	0.982467
1393	(CHARLOTTE BAG SUKI DESIGN, WOODLAND CHARLOTTE...	(CHARLOTTE BAG PINK POLKADOT, STRAWBERRY CHARL...	0.018595	0.020989	0.011302	0.607784	28.957623	0.010911	2.496105	0.983760
1394	(CHARLOTTE BAG PINK POLKADOT, STRAWBERRY CHARL...	(CHARLOTTE BAG SUKI DESIGN, WOODLAND CHARLOTTE...	0.020989	0.018595	0.011302	0.538462	28.957623	0.010911	2.126378	0.986165
1395	(CHARLOTTE BAG PINK POLKADOT, WOODLAND CHARLOT...	(CHARLOTTE BAG SUKI DESIGN, STRAWBERRY CHARLOT...	0.021824	0.018483	0.011302	0.517857	28.017319	0.010898	2.035738	0.985822
1396	(WOODLAND CHARLOTTE BAG, STRAWBERRY CHARLOTTE ...	(CHARLOTTE BAG PINK POLKADOT, CHARLOTTE BAG SU...	0.022492	0.018261	0.011302	0.502475	27.516648	0.010891	1.973247	0.985832

Frequent Itemsets:

	antecedents	consequents	antecedent support	consequent support	support	confidence	lift	leverage	conviction	zhangs_metric
17	(BEADED CRYSTAL HEART PINK ON STICK)	(DOTCOM POSTAGE)	0.011469	0.039305	0.011190	0.975728	24.824404	0.010740	39.580626	0.970851
614	(HERB MARKER CHIVES, HERB MARKER THYME)	(HERB MARKER PARSLEY)	0.010411	0.012916	0.010077	0.967914	74.938272	0.009942	30.764113	0.997036
607	(HERB MARKER CHIVES, HERB MARKER ROSEMARY)	(HERB MARKER PARSLEY)	0.010355	0.012916	0.010021	0.967742	74.924917	0.009887	30.599599	0.996977
619	(HERB MARKER CHIVES, HERB MARKER ROSEMARY)	(HERB MARKER THYME)	0.010355	0.012916	0.010021	0.967742	74.924917	0.009887	30.599599	0.996977
1217	(HERB MARKER BASIL, HERB MARKER ROSEMARY, HERB...	(HERB MARKER THYME)	0.010578	0.012916	0.010188	0.963158	74.570009	0.010052	26.792276	0.997137
...	...	...	...	...	...	...	...	...	...	...
25	(RED RETROSPOT CUP)	(BLUE POLKADOT CUP)	0.021378	0.018038	0.010689	0.500000	27.719136	0.010304	1.963924	0.984981
1159	(STRAWBERRY CHARLOTTE BAG, RED RETROSPOT CHARL...	(CHARLOTTE BAG PINK POLKADOT, WOODLAND CHARLOT...	0.026834	0.021824	0.013417	0.500000	22.910714	0.012832	1.956352	0.982723
113	(HAND WARMER RED LOVE HEART)	(HAND WARMER SCOTTY DOG DESIGN)	0.021935	0.030286	0.010968	0.500000	16.509191	0.010303	1.939428	0.960496
147	(LOVE HOT WATER BOTTLE)	(HOT WATER BOTTLE KEEP CALM)	0.025832	0.042701	0.012916	0.500000	11.709257	0.011813	1.914597	0.938850
370	(CHARLOTTE BAG PINK POLKADOT, WOODLAND CHARLOT...	(PACK OF 72 RETROSPOT CAKE CASES)	0.021824	0.071206	0.010912	0.500000	7.021892	0.009358	1.857588	0.876722