After renamed all the columns in the tables, I started the data exploration to figure out number of SKUs, and number of stores.

To find out the number of SKUs, I counted from the table skuinfo, and there are 1,556,030 SKUs in the registration.

While the number for the stores, I used the table strinfo and explored that there are 453 stores in the table.

To solve the problem and to find out the 20 moves and 100 best candidates.

I chose to select a subset.

I found that the most transactions are from store 8402, which is also stocking one of the most SKUs. The store is located in Metairie in LA.

So I selected the store 8402 as the main store to focus on.

It is also important to figure out perfect dept to perform association rules.

I firstly selected from women’s favorite dept like cosmetics, clothes and household supplies.

[9000,5506,8104,3107] which are [“ANNASUI”,” MOSCHINO”,” COP KEY”,” ONEIDA”].

And there are high lift pairs in expectation, of which are all above 4.13 and have the mean of 409.02.

|  |
| --- |
| antecedents consequents antecedent support consequent support \ |
| 0 (SKU\_202772) (SKU\_6671928) 0.003485 0.000845 |
| 1 (SKU\_6671928) (SKU\_202772) 0.000845 0.003485 |
| 2 (SKU\_7898283) (SKU\_258376) 0.000422 0.000317 |
| 3 (SKU\_258376) (SKU\_7898283) 0.000317 0.000422 |
| 4 (SKU\_452873) (SKU\_2392941) 0.000739 0.004013 |
| 5 (SKU\_2392941) (SKU\_452873) 0.004013 0.000739 |
| 6 (SKU\_558392) (SKU\_8408179) 0.000422 0.000211 |
| 7 (SKU\_8408179) (SKU\_558392) 0.000211 0.000422 |
| 8 (SKU\_6736924) (SKU\_668393) 0.007286 0.000317 |
| 9 (SKU\_668393) (SKU\_6736924) 0.000317 0.007286 |
| 10 (SKU\_863554) (SKU\_6162191) 0.000106 0.001162 |
| 11 (SKU\_6162191) (SKU\_863554) 0.001162 0.000106 |
| 12 (SKU\_5148032) (SKU\_2008383) 0.000106 0.000317 |
| 13 (SKU\_2008383) (SKU\_5148032) 0.000317 0.000106 |
| 14 (SKU\_3430746) (SKU\_2140758) 0.000422 0.002218 |
| 15 (SKU\_2140758) (SKU\_3430746) 0.002218 0.000422 |
| 16 (SKU\_5178393) (SKU\_2168394) 0.000528 0.000528 |
| 17 (SKU\_2168394) (SKU\_5178393) 0.000528 0.000528 |
| 18 (SKU\_2178340) (SKU\_8607375) 0.000950 0.000950 |
| 19 (SKU\_8607375) (SKU\_2178340) 0.000950 0.000950 |
| 20 (SKU\_3800041) (SKU\_2630150) 0.001795 0.003485 |
| 21 (SKU\_2630150) (SKU\_3800041) 0.003485 0.001795 |
| 22 (SKU\_3718013) (SKU\_3013964) 0.028194 0.000739 |
| 23 (SKU\_3013964) (SKU\_3718013) 0.000739 0.028194 |
| 24 (SKU\_3040746) (SKU\_5361038) 0.005808 0.001901 |
| 25 (SKU\_5361038) (SKU\_3040746) 0.001901 0.005808 |
| 26 (SKU\_3060746) (SKU\_3160746) 0.004963 0.001584 |
| 27 (SKU\_3160746) (SKU\_3060746) 0.001584 0.004963 |
| 28 (SKU\_3070746) (SKU\_3452517) 0.000739 0.002112 |
| 29 (SKU\_3452517) (SKU\_3070746) 0.002112 0.000739 |
| 30 (SKU\_9682771) (SKU\_3248393) 0.000739 0.000422 |
| 31 (SKU\_3248393) (SKU\_9682771) 0.000422 0.000739 |
| 32 (SKU\_3420746) (SKU\_6162191) 0.000634 0.001162 |
| 33 (SKU\_6162191) (SKU\_3420746) 0.001162 0.000634 |
| 34 (SKU\_3718013) (SKU\_5078393) 0.028194 0.000211 |
| 35 (SKU\_5078393) (SKU\_3718013) 0.000211 0.028194 |
| 36 (SKU\_8318394) (SKU\_4838283) 0.000106 0.000422 |
| 37 (SKU\_4838283) (SKU\_8318394) 0.000422 0.000106 |
| 38 (SKU\_9871715) (SKU\_5011474) 0.010665 0.000317 |
| 39 (SKU\_5011474) (SKU\_9871715) 0.000317 0.010665 |
| 40 (SKU\_9491148) (SKU\_6221150) 0.003273 0.007814 |
| 41 (SKU\_6221150) (SKU\_9491148) 0.007814 0.003273 |
| 42 (SKU\_7171290) (SKU\_6661714) 0.006653 0.005174 |
| 43 (SKU\_6661714) (SKU\_7171290) 0.005174 0.006653 |
| 44 (SKU\_7431714) (SKU\_9871715) 0.000422 0.010665 |
| 45 (SKU\_9871715) (SKU\_7431714) 0.010665 0.000422 |
| 46 (SKU\_7451714) (SKU\_9871715) 0.000317 0.010665 |
| 47 (SKU\_9871715) (SKU\_7451714) 0.010665 0.000317 |

A screenshot of a cell phone

Description automatically generated

Though there are 48 pairs, same pairs are duplicated for one more time for the sequence for the antecedent and consequent support. So there are only 48 SKUs with 24 pairs.

To make a comparison, I select a single department to see if there is any difference.

So I selected the dept 9306 which stands for SPERRY, the shoe brand, as I found people are intended to buy similar types or colors based on the aesthetic variety.

|  |
| --- |
| antecedents consequents antecedent support consequent support \ |
| 0 (SKU\_387) (SKU\_7210272) 0.001558 0.001700 |
| 1 (SKU\_7210272) (SKU\_387) 0.001700 0.001558 |
| 2 (SKU\_70387) (SKU\_5960388) 0.000283 0.001133 |
| 3 (SKU\_5960388) (SKU\_70387) 0.001133 0.000283 |
| 4 (SKU\_80613) (SKU\_6480373) 0.000850 0.000992 |
| 5 (SKU\_6480373) (SKU\_80613) 0.000992 0.000850 |
| 6 (SKU\_297373) (SKU\_7217927) 0.000283 0.001275 |
| 7 (SKU\_7217927) (SKU\_297373) 0.001275 0.000283 |
| 8 (SKU\_300613) (SKU\_5601382) 0.000708 0.002691 |
| 9 (SKU\_5601382) (SKU\_300613) 0.002691 0.000708 |
| 10 (SKU\_330613) (SKU\_1590304) 0.000567 0.002691 |
| 11 (SKU\_1590304) (SKU\_330613) 0.002691 0.000567 |
| 12 (SKU\_837418) (SKU\_8404190) 0.000992 0.000283 |
| 13 (SKU\_8404190) (SKU\_837418) 0.000283 0.000992 |
| 14 (SKU\_1161368) (SKU\_6531664) 0.001841 0.001558 |
| 15 (SKU\_6531664) (SKU\_1161368) 0.001558 0.001841 |
| 16 (SKU\_5721379) (SKU\_1287418) 0.000425 0.000708 |
| 17 (SKU\_1287418) (SKU\_5721379) 0.000708 0.000425 |
| 18 (SKU\_1300613) (SKU\_7230515) 0.000425 0.002691 |
| 19 (SKU\_7230515) (SKU\_1300613) 0.002691 0.000425 |
| 20 (SKU\_5787485) (SKU\_1307418) 0.000283 0.000425 |
| 21 (SKU\_1307418) (SKU\_5787485) 0.000425 0.000283 |
| 22 (SKU\_7031491) (SKU\_1614189) 0.000425 0.000425 |
| 23 (SKU\_1614189) (SKU\_7031491) 0.000425 0.000425 |
| 24 (SKU\_1987391) (SKU\_9363321) 0.000142 0.002125 |
| 25 (SKU\_9363321) (SKU\_1987391) 0.002125 0.000142 |
| 26 (SKU\_2101484) (SKU\_7167373) 0.000425 0.000283 |
| 27 (SKU\_7167373) (SKU\_2101484) 0.000283 0.000425 |
| 28 (SKU\_6411664) (SKU\_3501494) 0.002550 0.000283 |
| 29 (SKU\_3501494) (SKU\_6411664) 0.000283 0.002550 |
| 30 (SKU\_4171379) (SKU\_9812672) 0.002125 0.001133 |
| 31 (SKU\_9812672) (SKU\_4171379) 0.001133 0.002125 |
| 32 (SKU\_6330293) (SKU\_4300511) 0.000708 0.000142 |
| 33 (SKU\_4300511) (SKU\_6330293) 0.000142 0.000708 |
| 34 (SKU\_4611749) (SKU\_6341739) 0.001558 0.001275 |
| 35 (SKU\_6341739) (SKU\_4611749) 0.001275 0.001558 |
| 36 (SKU\_5074329) (SKU\_6784436) 0.000708 0.000425 |
| 37 (SKU\_6784436) (SKU\_5074329) 0.000425 0.000708 |
| 38 (SKU\_9832672) (SKU\_5091246) 0.000708 0.004108 |
| 39 (SKU\_5091246) (SKU\_9832672) 0.004108 0.000708 |
| 40 (SKU\_8501367) (SKU\_6431664) 0.001558 0.001700 |
| 41 (SKU\_6431664) (SKU\_8501367) 0.001700 0.001558 |
| 42 (SKU\_6561491) (SKU\_8430730) 0.000425 0.000142 |
| 43 (SKU\_8430730) (SKU\_6561491) 0.000142 0.000425 |
| 44 (SKU\_7047392) (SKU\_9397511) 0.000425 0.002125 |
| 45 (SKU\_9397511) (SKU\_7047392) 0.002125 0.000425 |
| 46 (SKU\_9383321) (SKU\_7242672) 0.000992 0.001416 |
| 47 (SKU\_7242672) (SKU\_9383321) 0.001416 0.000992 |
| 48 (SKU\_9983425) (SKU\_7807485) 0.000708 0.000283 |
| 49 (SKU\_7807485) (SKU\_9983425) 0.000283 0.000708 |
| 50 (SKU\_9373321) (SKU\_9120612) 0.001983 0.000425 |
| 51 (SKU\_9120612) (SKU\_9373321) 0.000425 0.001983 |

A screenshot of a cell phone

Description automatically generated

The outcome is great with the min lift of 48.7, and the mean of 452.89. There are 52 SKUs with 28 pairs under the association rules.

So that together, there would be 100 SKUs candidates with 50 pairs.

The recommendation for the moving is according to the lift, the higher the better.

The candidates pairs are listed in a descendant sequence for lift.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No.** | **Column2** | **Column3** | **support** | **confidence** | **lift** |
| 1 | (SKU\_2008383) | (SKU\_5148032) | 0.000106 | 0.333333 | 3156.666667 |
| 2 | (SKU\_4838283) | (SKU\_8318394) | 0.000106 | 0.25 | 2367.5 |
| 3 | (SKU\_6561491) | (SKU\_8430730) | 0.000142 | 0.333333 | 2353.333333 |
| 4 | (SKU\_6330293) | (SKU\_4300511) | 0.000142 | 0.2 | 1412 |
| 5 | (SKU\_8408179) | (SKU\_558392) | 0.000106 | 0.5 | 1183.75 |
| 6 | (SKU\_5787485) | (SKU\_1307418) | 0.000142 | 0.5 | 1176.666667 |
| 7 | (SKU\_2101484) | (SKU\_7167373) | 0.000142 | 0.333333 | 1176.666667 |
| 8 | (SKU\_6162191) | (SKU\_863554) | 0.000106 | 0.090909 | 860.909091 |
| 9 | (SKU\_258376) | (SKU\_7898283) | 0.000106 | 0.333333 | 789.166667 |
| 10 | (SKU\_7031491) | (SKU\_1614189) | 0.000142 | 0.333333 | 784.444444 |
| 11 | (SKU\_9983425) | (SKU\_7807485) | 0.000142 | 0.2 | 706 |
| 12 | (SKU\_837418) | (SKU\_8404190) | 0.000142 | 0.142857 | 504.285714 |
| 13 | (SKU\_5721379) | (SKU\_1287418) | 0.000142 | 0.333333 | 470.666667 |
| 14 | (SKU\_1987391) | (SKU\_9363321) | 0.000142 | 1 | 470.666667 |
| 15 | (SKU\_5074329) | (SKU\_6784436) | 0.000142 | 0.2 | 470.666667 |
| 16 | (SKU\_70387) | (SKU\_5960388) | 0.000142 | 0.5 | 441.25 |
| 17 | (SKU\_297373) | (SKU\_7217927) | 0.000142 | 0.5 | 392.222222 |
| 18 | (SKU\_2168394) | (SKU\_5178393) | 0.000106 | 0.2 | 378.8 |
| 19 | (SKU\_3248393) | (SKU\_9682771) | 0.000106 | 0.25 | 338.214286 |
| 20 | (SKU\_6411664) | (SKU\_3501494) | 0.000142 | 0.055556 | 196.111111 |
| 21 | (SKU\_80613) | (SKU\_6480373) | 0.000142 | 0.166667 | 168.095238 |
| 22 | (SKU\_9373321) | (SKU\_9120612) | 0.000142 | 0.071429 | 168.095238 |
| 23 | (SKU\_7047392) | (SKU\_9397511) | 0.000142 | 0.333333 | 156.888889 |
| 24 | (SKU\_6162191) | (SKU\_3420746) | 0.000106 | 0.090909 | 143.484848 |
| 25 | (SKU\_1300613) | (SKU\_7230515) | 0.000142 | 0.333333 | 123.859649 |
| 26 | (SKU\_8607375) | (SKU\_2178340) | 0.000106 | 0.111111 | 116.91358 |
| 27 | (SKU\_2140758) | (SKU\_3430746) | 0.000106 | 0.047619 | 112.738095 |
| 28 | (SKU\_9383321) | (SKU\_7242672) | 0.000142 | 0.142857 | 100.857143 |
| 29 | (SKU\_330613) | (SKU\_1590304) | 0.000142 | 0.25 | 92.894737 |
| 30 | (SKU\_300613) | (SKU\_5601382) | 0.000142 | 0.2 | 74.315789 |
| 31 | (SKU\_4611749) | (SKU\_6341739) | 0.000142 | 0.090909 | 71.313131 |
| 32 | (SKU\_3452517) | (SKU\_3070746) | 0.000106 | 0.05 | 67.642857 |
| 33 | (SKU\_4171379) | (SKU\_9812672) | 0.000142 | 0.066667 | 58.833333 |
| 34 | (SKU\_387) | (SKU\_7210272) | 0.000142 | 0.090909 | 53.484848 |
| 35 | (SKU\_8501367) | (SKU\_6431664) | 0.000142 | 0.090909 | 53.484848 |
| 36 | (SKU\_1161368) | (SKU\_6531664) | 0.000142 | 0.076923 | 49.370629 |
| 37 | (SKU\_9832672) | (SKU\_5091246) | 0.000142 | 0.2 | 48.689655 |
| 38 | (SKU\_668393) | (SKU\_6736924) | 0.000106 | 0.333333 | 45.748792 |
| 39 | (SKU\_6671928) | (SKU\_202772) | 0.000106 | 0.125 | 35.871212 |
| 40 | (SKU\_2392941) | (SKU\_452873) | 0.000106 | 0.026316 | 35.601504 |
| 41 | (SKU\_5011474) | (SKU\_9871715) | 0.000106 | 0.333333 | 31.254125 |
| 42 | (SKU\_9871715) | (SKU\_7451714) | 0.000106 | 0.009901 | 31.254125 |
| 43 | (SKU\_6661714) | (SKU\_7171290) | 0.001056 | 0.204082 | 30.677033 |
| 44 | (SKU\_9871715) | (SKU\_7431714) | 0.000106 | 0.009901 | 23.440594 |
| 45 | (SKU\_5078393) | (SKU\_3718013) | 0.000106 | 0.5 | 17.734082 |
| 46 | (SKU\_2630150) | (SKU\_3800041) | 0.000106 | 0.030303 | 16.88057 |
| 47 | (SKU\_3160746) | (SKU\_3060746) | 0.000106 | 0.066667 | 13.432624 |
| 48 | (SKU\_5361038) | (SKU\_3040746) | 0.000106 | 0.055556 | 9.565657 |
| 49 | (SKU\_3013964) | (SKU\_3718013) | 0.000106 | 0.142857 | 5.066881 |
| 50 | (SKU\_6221150) | (SKU\_9491148) | 0.000106 | 0.013514 | 4.12816 |