Cohort Analysis

COHORT ANALYSIS OF A UK-BASED ONLINE RETAIL STORE

About the project

The overall purpose of this project is to get better understanding of customer behaviours with cohort analysis : examining purchasing patterns of customers, changes in purchase quantity and sales throughout the time.

About the dataset

Dataset collected from UCI Machine Learning Repository: Online Retail Data Set, a transnational data set which contains all the transactions occurring between 01/12/2010 and 09/12/2011 for a UK-based and registered non-store online retail that sells unique all-occasion gifts.

Cohort Analysis

Introduction	Cohort - User Retention Rate	Cohort - Average Quantity Sold and Sal..	Results

Cohort - Retained Customer Count

Customer Count: 21 – 885

Cohort Index

Cohort Date	1	2	3	4	5	6	7	8	9	10	11	12	13
2010-12-01	885	324	286	340	321	352	321	309	313	350	331	445	235
2011-01-01	417	92	111	96	134	120	103	101	125	136	152	49	
2011-02-01	380	71	71	108	103	94	96	106	94	116	26		
2011-03-01	452	68	114	90	101	76	121	104	126	39			
2011-04-01	300	64	61	63	59	68	65	78	22				
2011-05-01	284	54	49	49	59	66	75	27					
2011-06-01	242	42	38	64	56	81	23						
2011-07-01	188	34	39	42	51	21							
2011-08-01	169	35	42	41	21								
2011-09-01	299	70	90	34									
2011-10-01	358	86	41										
2011-11-01	323	36											
2011-12-01	41												

Cohort - Customer Retention Rate

Customer Retention Rate: 6.84% – 100.00%

Cohort Index

Cohort Date	1	2	3	4	5	6	7	8	9	10	11	12	13
2010-12-01	100.00%	36.61%	32.32%	38.42%	36.27%	39.77%	36.27%	34.92%	35.37%	39.55%	37.40%	50.28%	26.55%
2011-01-01	100.00%	22.06%	26.62%	23.02%	32.13%	28.78%	24.70%	24.22%	29.98%	32.61%	36.45%	11.75%	
2011-02-01	100.00%	18.68%	18.68%	28.42%	27.11%	24.74%	25.26%	27.89%	24.74%	30.53%	6.84%		
2011-03-01	100.00%	15.04%	25.22%	19.91%	22.35%	16.81%	26.77%	23.01%	27.88%	8.63%			
2011-04-01	100.00%	21.33%	20.33%	21.00%	19.67%	22.67%	21.67%	26.00%	7.33%				
2011-05-01	100.00%	19.01%	17.25%	17.25%	20.77%	23.24%	26.41%	9.51%					
2011-06-01	100.00%	17.36%	15.70%	26.45%	23.14%	33.47%	9.50%						
2011-07-01	100.00%	18.09%	20.74%	22.34%	27.13%	11.17%							
2011-08-01	100.00%	20.71%	24.85%	24.26%	12.43%								
2011-09-01	100.00%	23.41%	30.10%	11.37%									
2011-10-01	100.00%	24.02%	11.45%										
2011-11-01	100.00%	11.15%											
2011-12-01	100.00%												

Cohort Analysis

Introduction	Cohort - User Retention Rate	Cohort - Average Quantity Sold and Sal..	Results

Cohort - Average Quantity Sold

Avg. Quantity
5.4 — 113.8

Cohort Index

Cohort Date	1	2	3	4	5	6	7	8	9	10	11	12	13
2010-12-01	12.1	15.7	15.7	15.9	13.6	14.9	16.1	15.6	18.2	17.7	19.0	13.6	15.4
2011-01-01	17.5	13.5	12.7	15.3	12.8	15.4	15.0	15.0	11.6	10.6	9.6	10.2	
2011-02-01	11.2	13.8	19.0	12.0	12.3	12.3	13.6	13.4	11.0	12.4	13.4		
2011-03-01	10.0	11.7	13.3	10.1	13.8	13.0	13.5	13.9	11.3	9.7			
2011-04-01	10.0	10.4	9.8	11.9	12.0	8.7	10.0	9.7	7.6				
2011-05-01	11.5	9.7	14.2	12.8	11.2	8.8	10.8	113.8					
2011-06-01	10.7	14.7	10.9	13.7	10.7	10.0	9.5						
2011-07-01	9.9	13.8	7.4	8.2	6.2	7.2							
2011-08-01	10.1	6.2	5.4	6.2	7.1								
2011-09-01	12.1	6.3	8.1	9.0									
2011-10-01	9.0	7.3	8.5										
2011-11-01	7.9	10.0											
2011-12-01	15.2												

Cohort - Average Sales

Avg. Sales
10.9 — 234.5

Cohort Index

Cohort Date	1	2	3	4	5	6	7	8	9	10	11	12	13
2010-12-01	22.2	27.3	26.9	27.2	21.2	28.1	28.3	27.4	29.3	33.5	34.0	23.6	25.8
2011-01-01	26.9	25.1	21.0	29.6	22.5	26.3	25.2	25.5	19.1	21.9	19.7	19.8	
2011-02-01	17.9	20.5	21.5	19.4	17.7	17.0	22.2	22.9	18.8	22.2	23.5		
2011-03-01	17.6	21.1	22.7	18.0	21.1	19.0	22.0	20.0	16.8	13.2			
2011-04-01	17.0	21.0	19.5	18.7	19.5	15.0	15.3	16.0	12.3				
2011-05-01	20.5	17.3	22.2	20.9	18.6	14.1	17.0	234.5					
2011-06-01	24.0	16.3	19.9	20.4	15.3	16.3	13.2						
2011-07-01	15.0	23.5	11.8	13.0	10.9	11.7							
2011-08-01	16.5	13.2	12.5	15.9	17.0								
2011-09-01	18.8	12.3	14.1	14.3									
2011-10-01	15.1	11.3	14.5										
2011-11-01	12.5	13.8											
2011-12-01	28.1												

Cohort Analysis

COHORT ANALYSIS - RESULTS

- Generally, retention rate dropped as times passed by. However, we can observe that 50% of customers who made their first purchased on 12/2010 returns on 11/2011. We can look for any campaigns or seasonal activities that led to this level of retention.

- It can be seen that the average quantity sold during recent cohort dates was facing a decline except the one on 05/2011 in which a customer purchased over 80K quantity for one specific product. Overall, this decline trend is a good insight to investigate the reasons behind and address it.