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MKTG-6332-01
6/8/2022

Sonogram RFM Analysis Assignment

Part I: Preliminary and Decile Analysis

1. What percent of customers responded (i.e. bought anything) from this email?

Bought from last email

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	94180	97.5	97.5	97.5
	yes	2371	2.5	2.5	100.0
	Total	96551	100.0	100.0	

2.5% of customers bought something from this email.

2. Of those who bought, what was the average dollars ordered from this email? (Hint: Use *Analyze... reports....case summaries*)

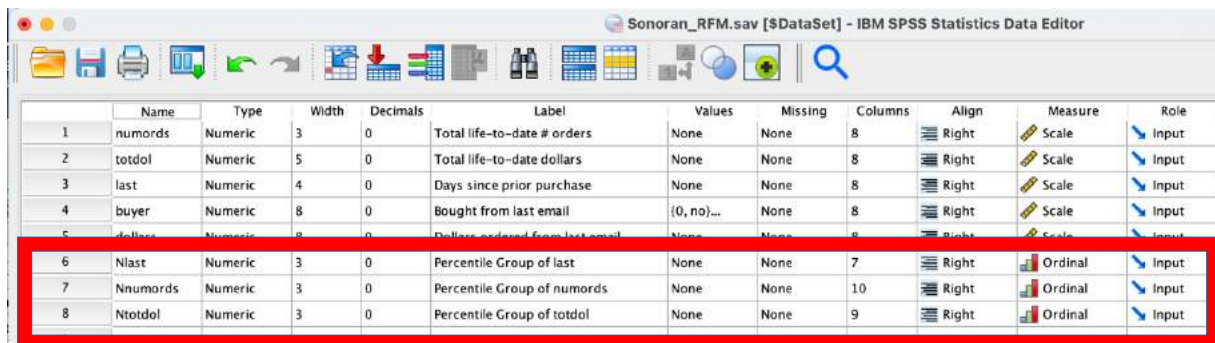
Case Summaries

Total life-to-date dollars

Bought from last email	N	Mean
no	94180	331.99
yes	2371	518.11
Total	96551	336.56

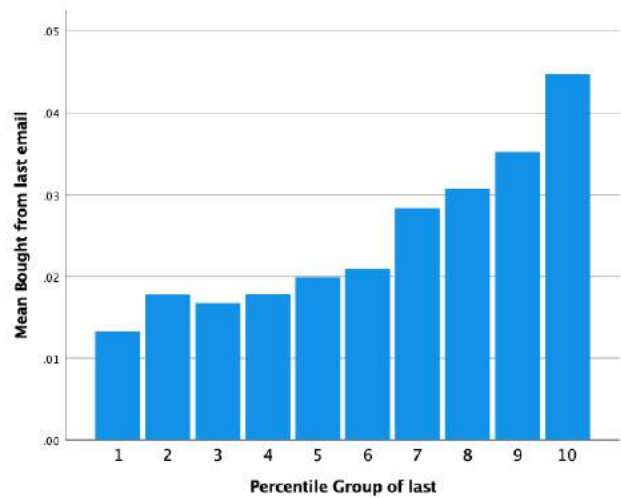
The average dollars ordered was \$518.11

3. Create decile variables for recency, frequency and monetary where 1 is highest.



	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	numords	Numeric	3	0	Total life-to-date # orders	None	None	8	Right	Scale	Input
2	totdol	Numeric	5	0	Total life-to-date dollars	None	None	8	Right	Scale	Input
3	last	Numeric	4	0	Days since prior purchase	None	None	8	Right	Scale	Input
4	buyer	Numeric	8	0	Bought from last email	{0, no}...	None	8	Right	Scale	Input
5	dollars	Numeric	8	0	Dollars ordered from last email	None	None	8	Right	Scale	Input
6	Nlast	Numeric	3	0	Percentile Group of last	None	None	7	Right	Ordinal	Input
7	Nnumords	Numeric	3	0	Percentile Group of numords	None	None	10	Right	Ordinal	Input
8	Ntotdol	Numeric	3	0	Percentile Group of totdol	None	None	9	Right	Ordinal	Input

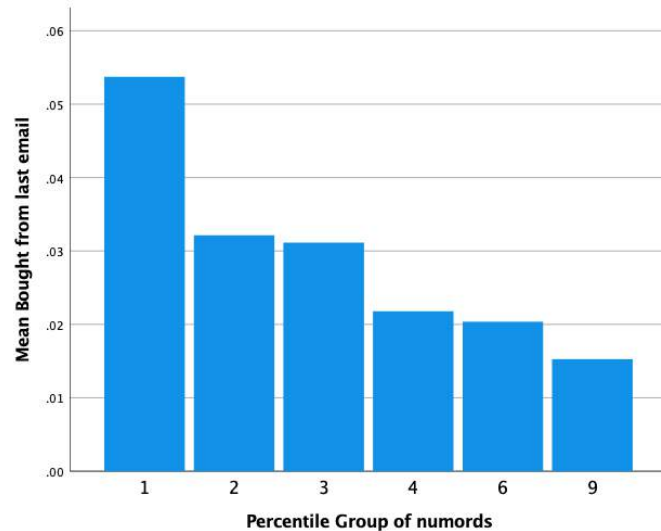
4. Create a bar chart showing the response rate (i.e., the proportion of customers who bought something) to this email by recency deciles. What insights can you derive from this chart?



Group 1: Has the largest variable, not purchasing anything for a long time at about 1.2%. They have the lowest probability of purchasing anything so we would not push a marketing campaign to them.

Group 10: 4.4% bought something most recency at the least amount of time. People who purchased most recency have a higher probability of buying something. We would push marketing campaigns to them.

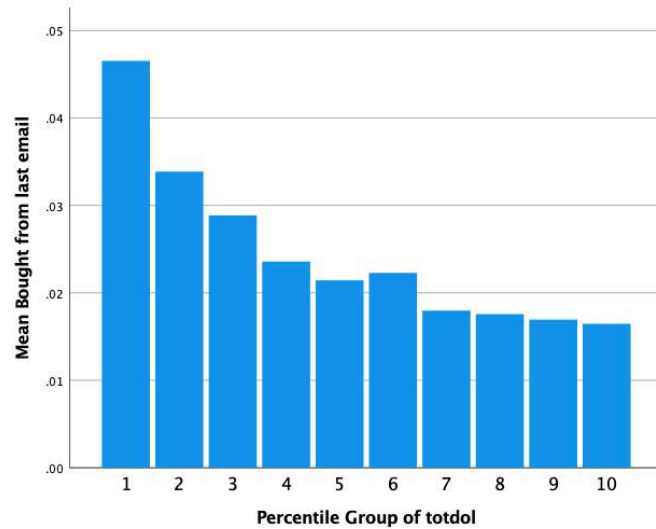
5. Create a bar chart showing the bar chart of response rate to this email by frequency deciles. What insights can you derive from this chart?



Group 1: Has the largest frequency of people that have bought something from us running about 5.2%.

Group 9: About 1.6% purchased least frequently and have a lower probability of buying anything.

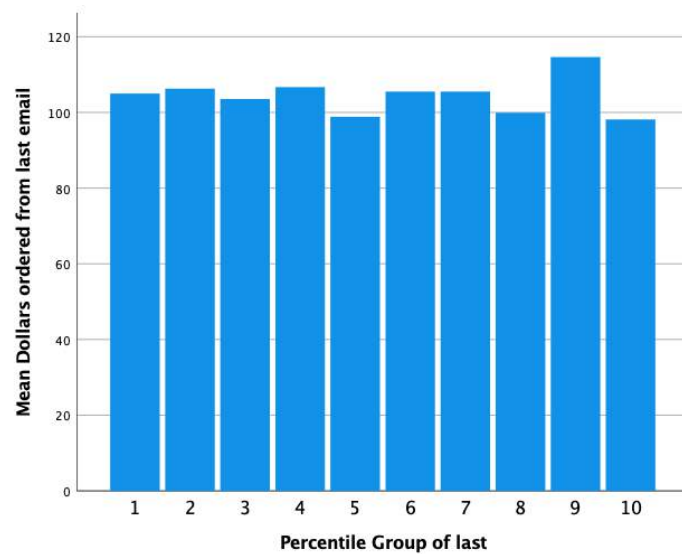
6. Create a bar chart showing the bar chart of response rate to this email by monetary deciles. What insights can you derive from this chart?



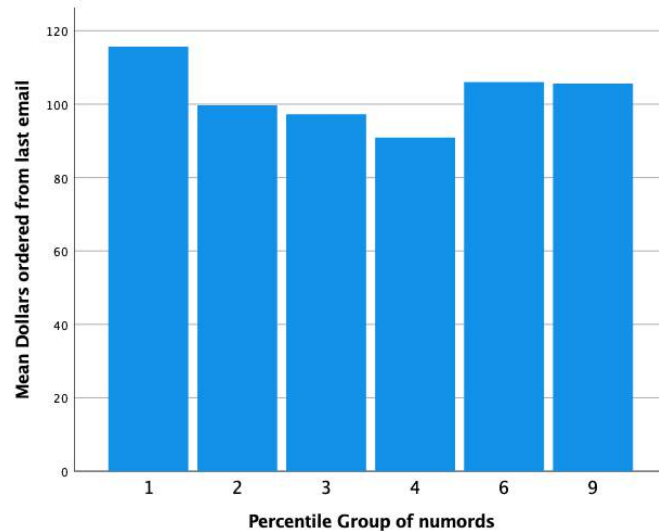
Group 1 spent the most on something at about 4.6% and drops off to Group 10 of people who spent the least amount at about 1.6%.

7. Using only those customers who placed an order from this email, create bar charts showing the average dollars ordered from this email by recency, frequency and monetary deciles.

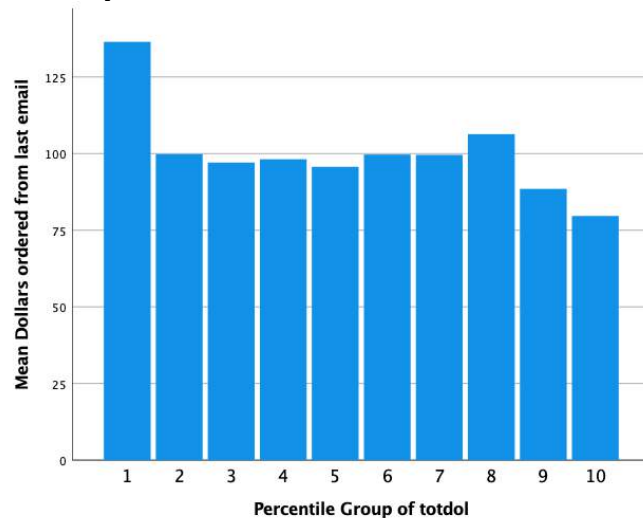
Recency



Frequency



Monetary



8. What do the above bar charts reveal about the likelihood of response and the size of the order across the different recency, frequency, and monetary deciles?

Bar Chart 1: Recency

People in Group 9 has the highest spent on things ordered from the last email but not the most recent. Group 9 has a higher probability of responding and spending more on orders from marketing campaigns. Group 10 are the ones that purchased from us most recently but spent the least on orders from the last email.

Bar Chart 2: Frequency

People in Group 9 spent the most frequent but spent less than Group 1 which spent less frequently but spent the most on orders from the last email. We would push out marketing campaigns to group 1.

Bar Chart 3: Monetary

Group 1 spent the most money on things ordered from the last email with the largest

amount of time. People in Group 10 spent the least amount from us most recently. We would want to push out marketing campaigns to Group 1 since they have a higher probability of ordering something and spending more from our marketing campaigns.

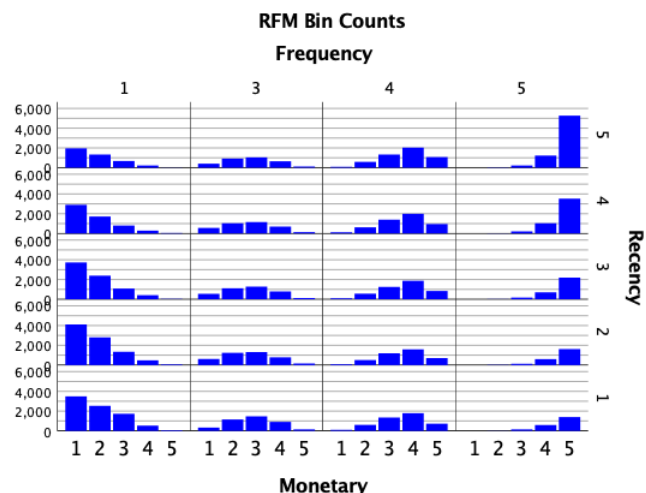
Part II: RFM Classification

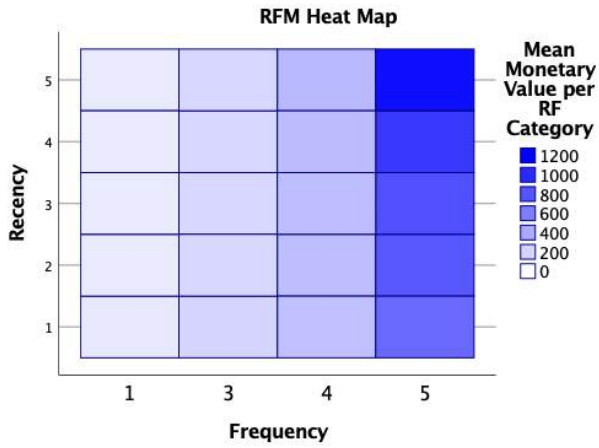
1. Create the RFM values using both the sequential and independent n-tiles approaches using SPSS and the instructions in the lecture slides. Label your RFM classification variables as RFM_IND and RFM_SEQ respectively

Sonoran_RFM.sav [DataSet] - IBM SPSS Statistics Data Editor

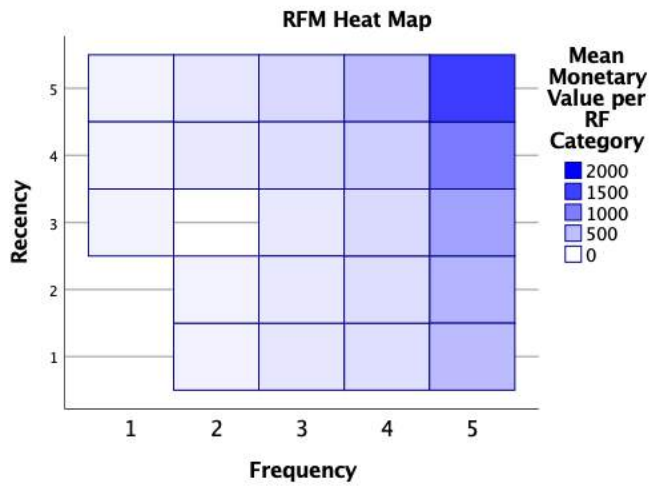
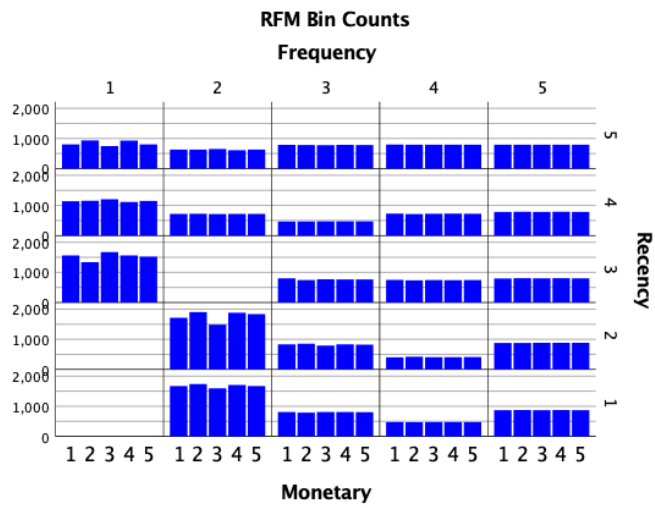
	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
2	totdol	Numeric	5	0	Total life-to-date dollars	None	None	8	Right	Scale	Input
3	last	Numeric	4	0	Days since prior purchase	None	None	8	Right	Scale	Input
4	buyer	Numeric	8	0	Bought from last email	{0, no}...	None	8	Right	Scale	Input
5	dollars	Numeric	8	0	Dollars ordered from last email	None	None	8	Right	Scale	Input
6	Nlast	Numeric	3	0	Percentile Group of last	None	None	7	Right	Ordinal	Input
7	Nnumords	Numeric	3	0	Percentile Group of numords	None	None	10	Right	Ordinal	Input
8	Ntotdol	Numeric	3	0	Percentile Group of totdol	None	None	9	Right	Ordinal	Input
9	filter_\$	Numeric	1	0	buyer=1 (FILTER)	{0, Not Selec...	None	10	Right	Nominal	Input
10	Recency_score	Numeric	3	0	Recency score	None	None	15	Right	Ordinal	Input
11	Frequency_score	Numeric	3	0	Frequency score	None	None	17	Right	Ordinal	Input
12	Monetary_score	Numeric	3	0	Monetary score	None	None	16	Right	Ordinal	Input
13	RFM_IND	Numeric	3	0	RFM score	None	None	11	Right	Scale	Input
14	Recency_score1_A	Numeric	3	0	Recency score	None	None	18	Right	Ordinal	Input
15	Frequency_score1_A	Numeric	3	0	Frequency score	None	None	20	Right	Ordinal	Input
16	Monetary_score1_A	Numeric	3	0	Monetary score	None	None	19	Right	Ordinal	Input
17	RFM_SEQ	Numeric	3	0	RFM score	None	None	14	Right	Scale	Input

Independent





Nested



2. Analyze the Bin counts and the Heat maps for each method. What do they tell you about each method? Based on these data, which method provides the best results.

I think the Independent provides the best results. Although the nested bins are more even and ideally, we are looking for an even distribution, there are some missing bins that indicate we should try another binning method. Both heat maps indicate customers spend more recently and more frequently.

3. Generate a report showing the number of customers, the mean value of dollars spent, minimum, maximum and Sum for each RFM cell for each of the approaches, (Hint: use *Analyze ... reports* 'N' will show the number of customers, 'Sum' will show the number of buyers, and 'mean' will give you the mean value of dollars spent per cell.)

See next page for results

Independent

Case Summaries

Total life-to-date dollars

RPM score	N	Mean	Minimum	Maximum	Sum
111	3506	37.17	4	73	130317
112	2539	108.23	74	140	274794
113	1740	178.94	141	240	311352
114	533	306.53	241	445	163380
115	70	558.96	449	854	42481
131	342	49.90	10	73	17067
132	1157	114.50	74	140	132481
133	1470	183.79	141	240	270175
134	912	312.35	241	448	284863
135	152	606.47	449	1698	92184
141	109	59.47	27	73	6482
142	617	111.89	74	140	69035
143	1351	190.76	141	240	257711
144	1801	324.22	241	448	583919
145	727	618.79	449	1875	449860
152	20	115.20	88	137	2304
153	148	197.36	142	240	29210
154	593	345.79	241	448	205051
155	1394	921.43	449	5373	1284479
211	4117	39.76	5	73	163705
212	2818	102.76	74	140	289590
213	1348	181.50	142	240	244661
214	477	300.11	241	447	143152
215	74	539.91	449	909	39953
231	614	51.87	8	73	31850
232	1251	106.35	74	140	133049
233	1325	186.41	141	240	246997
234	787	315.77	241	448	248514
235	169	578.21	450	1158	97718
241	85	58.02	27	73	4932
242	515	110.64	74	140	56978
243	1198	190.64	141	240	228388
244	1595	329.50	241	448	525551
245	713	623.28	449	3072	444401
251	1	60.00	60	60	60
252	23	121.57	77	140	2796
253	133	202.78	144	240	26970
254	600	357.21	241	448	214329
255	1627	1000.49	449	9389	1627802
311	5727	40.17	7	73	149719
312	2390	102.74	74	140	245549
313	1094	181.28	141	240	198521
314	417	306.83	242	440	127947
315	43	576.53	449	954	24791
331	554	52.50	15	73	29083
332	1112	107.53	74	140	119569
333	1278	185.37	141	240	236902
334	792	314.49	241	448	249079
335	122	592.83	449	1198	72325
341	94	57.87	26	73	5440
342	573	110.75	75	140	61462
343	1258	188.72	141	240	237406
344	1882	328.94	241	448	619074
345	845	626.64	449	2241	529508
351	2	53.50	52	55	107
352	25	113.96	82	139	2849
353	168	200.05	141	240	33608
354	712	350.71	241	448	249704
355	2202	1031.78	449	10711	2271980
411	2908	38.99	2	73	113387
412	1724	102.60	74	140	176875
413	807	181.04	141	239	146100
414	298	297.13	241	443	88544
415	42	579.95	454	934	24358
431	559	51.71	12	73	28906
432	1041	107.33	74	140	111734
433	1159	186.34	141	240	215970
434	702	313.51	241	448	220084
435	140	566.66	450	1108	79332
441	130	58.32	25	73	7321
442	632	109.81	74	140	69399
443	1407	192.10	141	240	270282
444	1989	330.89	241	448	658150
445	959	623.28	449	2412	597727
452	22	123.14	95	140	2753
453	216	198.47	141	240	42869
454	1043	355.46	241	448	370749
455	3526	1159.36	449	21316	4087889
511	1961	40.02	2	73	78474
512	1344	102.54	74	140	137809
513	685	180.17	142	239	123418
514	231	306.03	241	446	70694
515	15	561.20	468	944	8418
531	415	52.93	16	73	21964
532	933	106.70	74	140	99547
533	1047	187.89	141	240	196720
534	653	317.78	241	448	207508
535	121	572.02	451	1140	69215
541	96	58.47	24	73	5613
542	586	110.92	74	140	65002
543	1331	190.83	141	240	253994
544	2040	330.07	241	448	673345
545	1078	633.25	449	2761	682641
551	1	69.00	69	69	69
552	30	120.60	92	139	3618
553	228	198.93	141	240	45357
554	1231	357.56	241	448	440158
555	5274	1156.54	449	14131	7154405
Total	96551	336.56	2	21316	32495362

Nested

Case Summaries

Total life-to-date dollars

RPM score	N	Mean	Minimum	Maximum	Sum
121	1675	21.77	4	58	36457
122	1738	50.20	39	89	87242
123	1599	93.94	70	115	150208
124	1710	136.79	116	164	233904
125	1672	247.91	165	864	414511
131	810	77.06	10	111	62422
132	791	128.06	112	147	101769
133	814	168.15	148	192	136874
134	813	227.32	193	270	184810
135	805	386.20	271	1698	310895
141	478	97.40	27	134	46556
142	473	161.31	135	189	76299
143	478	221.36	190	255	105411
144	478	297.52	236	348	142214
145	476	481.38	349	1032	229138
151	874	172.42	48	236	150693
152	877	284.55	237	317	249554
153	874	401.08	338	472	350543
154	877	572.73	473	709	502284
155	875	1182.81	710	5373	1034959
221	1719	22.10	5	38	37989
222	1903	48.39	39	59	92083
223	1490	78.45	60	98	116895
224	1884	114.20	99	148	215144
225	1838	227.94	149	909	418950
231	833	58.97	8	84	49122
232	857	107.32	85	128	91974
233	794	155.41	129	180	123394
234	836	215.25	181	258	179946
235	826	379.77	250	1158	313692
241	407	98.80	27	136	40210
242	425	164.18	137	192	69777
243	412	221.75	193	253	91361
244	410	300.89	254	358	123363
245	415	497.03	359	1710	206268
251	882	182.59	29	253	161047
252	883	313.52	254	371	276836
253	885	437.85	372	514	387476
254	886	625.32	515	774	554834
255	885	1380.60	775	9389	1221435
311	1564	23.21	7	35	36295
312	1343	45.26	36	58	60781
313	1678	73.63	59	93	123543
314	1564	114.59	94	143	178221
315	1522	227.65	144	954	346487
331	806	61.77	15	88	49784
332	746	111.54	89	133	83209
333	772	158.43	134	183	122308
334	768	217.68	184	258	167181
335	766	371.38	239	1198	284476
341	753	105.42	28	149	82394
342	740	181.99	150	215	134674
343	750	252.84	216	292	189632
344	745	340.97	293	401	254020
345	747	567.49	402	2241	423915
351	801	235.19	32	372	188391
352	807	390.17	323	460	314870
353	806	543.88	461	638	438371
354	807	777.07	639	972	627577
355	805	1688.56	973	10711	1359294
411	1144	20.73	2	33	23711
412	1159	44.34	34	58	51386
413	1210	72.74	59	89	88015
414	1114	113.51	90	139	126410
415	1152	225.44	140	934	259702
421	722	57.70	12	83	41660
422	724	107.71	84	131	78000
423	716	155.78	132	182	111542
424	720	216.97	183	258	156218
425	719	373.58	259	1108	268806
431	468	92.74	25	128	43403
432	468	161.18	129	191	75433
433	471	223.59	192	256	105311
434	475	304.56	257	363	144667
435	471	516.55	364	2412	243296
441	729	155.13	34	210	113890
442	715	251.21	211	285	179812
443	725	340.36	296	385	246759
444	731	444.73	386	516	325100
445	724	716.77	517	1896	518939
451	789	339.52	117	452	267880
452	790	547.26	453	642	432338
453	787	771.43	643	920	607119
454	792	1121.89	921	1364	888540
455	789	2427.95	1385	21316	1915652
511	808	22.77	2	38	18400
512	937	48.58	39	59	45523
513	751	70.29	60	98	59549
514	934	118.12	90	149	111256
515	806	228.39	150	944	184685
521	634	62.75	16	88	39784
522	633	111.47	89	135	70559
523	653	162.38	136	188	106034
524	615	221.13	189	264	137227
525	634	380.68	265	1140	241350
531	789	111.60	24	155	88053
532	784	188.30	156	221	147626
533	781	259.72	222	299	202841
534	788	352.27	300	413	277588
535	786	578.63	414	2761	454802
541	799	214.80	46	285	171627
542	797	346.27	286	399	275974
543	796	458.28	400	524	364793
544	795	602.78	525	700	479012
545	798	982.42	701	3559	783973
551	796	482.00	143	650	383675
552	796	802.16	651	980	638519
553	798	1154.81	961	1367	921542
554	798	1879.74	1389	2104	1537071
555	796	3513.70	2105	14131	2796906
Total	96551	336.56	2	21316	32495094

4. Which RFM cells had the highest average dollars spent for each method?

Independent: Bin 555 has the highest average dollars spent.

Nested: Bin 555 has the highest average dollars spent.

5. Generate a report showing the number of customers, the mean value of bought from the last email, minimum, maximum and Sum for each RFM cell for each of the approaches,

See next page for results

Independent

Case Summaries

Bought from last email					
RPM score	N	Mean	Minimum	Maximum	Sum
121	1675	.01	no	yes	20
122	1738	.01	no	yes	19
123	1599	.01	no	yes	16
124	1710	.01	no	yes	24
125	1672	.01	no	yes	12
131	810	.01	no	yes	12
132	791	.02	no	yes	13
133	814	.02	no	yes	19
134	813	.01	no	yes	12
135	805	.02	no	yes	13
141	478	.01	no	yes	4
142	473	.02	no	yes	10
143	478	.03	no	yes	14
144	478	.02	no	yes	8
145	476	.02	no	yes	8
151	874	.02	no	yes	20
152	877	.01	no	yes	13
153	874	.02	no	yes	21
154	877	.03	no	yes	24
155	875	.02	no	yes	17
221	1719	.01	no	yes	25
222	1801	.01	no	yes	20
223	1490	.01	no	yes	13
224	1884	.02	no	yes	29
225	1838	.02	no	yes	29
231	833	.03	no	yes	21
232	857	.02	no	yes	14
233	794	.02	no	yes	16
234	836	.02	no	yes	14
235	826	.01	no	yes	9
241	407	.02	no	yes	7
242	425	.02	no	yes	10
243	412	.02	no	yes	8
244	430	.01	no	yes	4
245	415	.02	no	yes	9
251	882	.02	no	yes	16
252	883	.02	no	yes	17
253	885	.03	no	yes	24
254	886	.03	no	yes	25
255	885	.03	no	yes	27
311	1564	.02	no	yes	25
312	1343	.01	no	yes	16
313	1678	.02	no	yes	30
314	1564	.01	no	yes	15
315	1522	.01	no	yes	22
331	806	.02	no	yes	17
332	746	.02	no	yes	15
333	772	.02	no	yes	14
334	768	.02	no	yes	15
335	766	.02	no	yes	15
341	753	.02	no	yes	16
342	740	.02	no	yes	13
343	750	.03	no	yes	20
344	745	.03	no	yes	19
345	747	.02	no	yes	14
351	801	.02	no	yes	17
352	807	.05	no	yes	27
353	806	.04	no	yes	29
354	807	.03	no	yes	27
355	805	.03	no	yes	28
411	1144	.01	no	yes	15
412	1159	.02	no	yes	20
413	1210	.02	no	yes	26
414	1114	.02	no	yes	27
415	1152	.01	no	yes	15
421	722	.03	no	yes	19
422	724	.02	no	yes	13
423	716	.02	no	yes	13
424	720	.02	no	yes	12
425	719	.03	no	yes	19
431	468	.02	no	yes	11
432	468	.03	no	yes	12
433	471	.01	no	yes	6
434	475	.01	no	yes	5
435	471	.03	no	yes	16
441	729	.05	no	yes	39
442	715	.04	no	yes	26
443	725	.04	no	yes	32
444	731	.04	no	yes	29
445	724	.03	no	yes	20
451	789	.03	no	yes	27
452	790	.06	no	yes	47
453	787	.05	no	yes	42
454	792	.05	no	yes	43
455	789	.05	no	yes	36
511	808	.02	no	yes	19
512	937	.03	no	yes	28
513	751	.03	no	yes	21
514	934	.03	no	yes	27
515	806	.02	no	yes	20
521	634	.03	no	yes	19
522	633	.03	no	yes	17
523	653	.03	no	yes	19
524	615	.03	no	yes	19
525	614	.02	no	yes	14
531	789	.04	no	yes	32
532	784	.03	no	yes	23
533	781	.04	no	yes	29
534	788	.04	no	yes	29
535	786	.03	no	yes	20
541	799	.04	no	yes	34
542	797	.05	no	yes	36
543	796	.04	no	yes	32
544	795	.04	no	yes	30
545	798	.04	no	yes	30
551	796	.06	no	yes	48
552	796	.06	no	yes	50
553	798	.06	no	yes	51
554	796	.07	no	yes	55
555	796	.09	no	yes	69
Total	96551	.02	no	yes	2371

Nested

Case Summaries

Bought from last email					
RPM score	N	Mean	Minimum	Maximum	Sum
111	3506	.01	no	yes	41
112	2539	.01	no	yes	28
113	1740	.01	no	yes	17
114	533	.01	no	yes	5
115	76	.00	no	no	0
131	342	.01	no	yes	5
132	1157	.02	no	yes	19
133	1470	.02	no	yes	29
134	912	.02	no	yes	16
135	152	.00	no	no	0
141	109	.00	no	no	0
142	617	.01	no	yes	7
143	1351	.03	no	yes	36
144	1801	.02	no	yes	30
145	727	.02	no	yes	16
152	20	.05	no	yes	1
153	148	.01	no	yes	1
154	592	.03	no	yes	17
155	1894	.02	no	yes	31
211	4117	.01	no	yes	48
212	2818	.01	no	yes	36
213	1348	.02	no	yes	27
214	477	.01	no	yes	4
215	74	.01	no	yes	1
231	614	.03	no	yes	18
232	1251	.02	no	yes	21
233	1325	.02	no	yes	22
234	787	.01	no	yes	11
235	169	.01	no	yes	2
241	85	.05	no	yes	4
242	515	.01	no	yes	6
243	1198	.02	no	yes	26
244	1595	.02	no	yes	32
245	713	.02	no	yes	16
251	1	.00	no	no	0
252	23	.04	no	yes	1
253	133	.02	no	yes	2
254	600	.02	no	yes	12
255	1627	.03	no	yes	48
311	3727	.02	no	yes	57
312	2390	.01	no	yes	29
313	1094	.01	no	yes	14
314	417	.02	no	yes	7
315	43	.02	no	yes	1
331	554	.02	no	yes	10
332	1112	.02	no	yes	23
333	1278	.02	no	yes	27
334	792	.02	no	yes	15
335	122	.01	no	yes	1
341	94	.02	no	yes	2
342	573	.02	no	yes	11
343	1258	.02	no	yes	27
344	1882	.03	no	yes	34
345	845	.02	no	yes	19
351	2	.00	no	no	0
352	25	.00	no	no	0
353	168	.02	no	yes	3
354	712	.02	no	yes	17
355	2202	.03	no	yes	77
411	2908	.02	no	yes	48
412	1724	.02	no	yes	40
413	807	.01	no	yes	11
414	298	.01	no	yes	3
415	42	.02	no	yes	1
431	559	.03	no	yes	17
432	1041	.02	no	yes	17
433	1139	.02	no	yes	20
434	702	.03	no	yes	21
435	140	.01	no	yes	1
441	130	.03	no	yes	4
442	632	.03	no	yes	18
443	1407	.03	no	yes	47
444	1989	.03	no	yes	69
445	959	.03	no	yes	29
452	22	.00	no	no	0
453	216	.06	no	yes	12
454	1043	.03	no	yes	33
455	3526	.05	no	yes	179
511	1961	.03	no	yes	54
512	1344	.03	no	yes	37
513	685	.02	no	yes	14
514	281	.04	no	yes	9
515	15	.07	no	yes	1
531	415	.03	no	yes	11
532	933	.03	no	yes	28
533	1047	.03	no	yes	31
534	653	.02	no	yes	16
535	121	.02	no	yes	2
541	96	.02	no	yes	2
542	586	.04	no	yes	21
543	1331	.04	no	yes	47
544	2040	.04	no	yes	79
545	1078	.03	no	yes	27
551	1	.00	no	no	0
552	30	.03	no	yes	1
553	228	.05	no	yes	11
554	1231	.05	no	yes	56
555	5274	.06	no	yes	324
Total	96551	.02	no	yes	2371

6. Which had the highest percentage response of the total number who purchased from this email?

Independent: Bin 515 has the highest percentage response of the total number who purchased from this email.

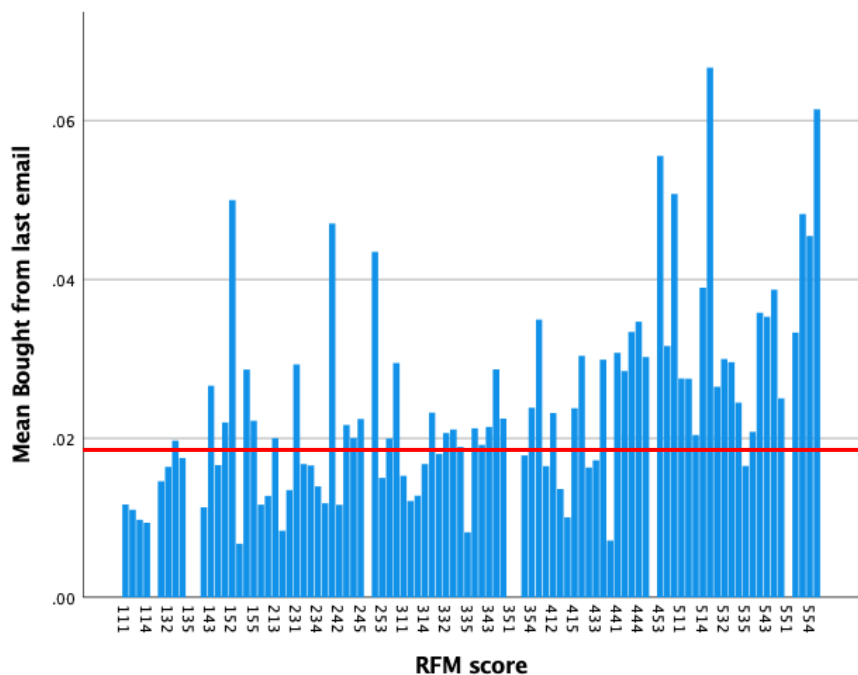
Nested: Bin 555 has the highest percentage response of the total number who purchased from this email.

7. Which cells would you recommend targeting in the future and why?

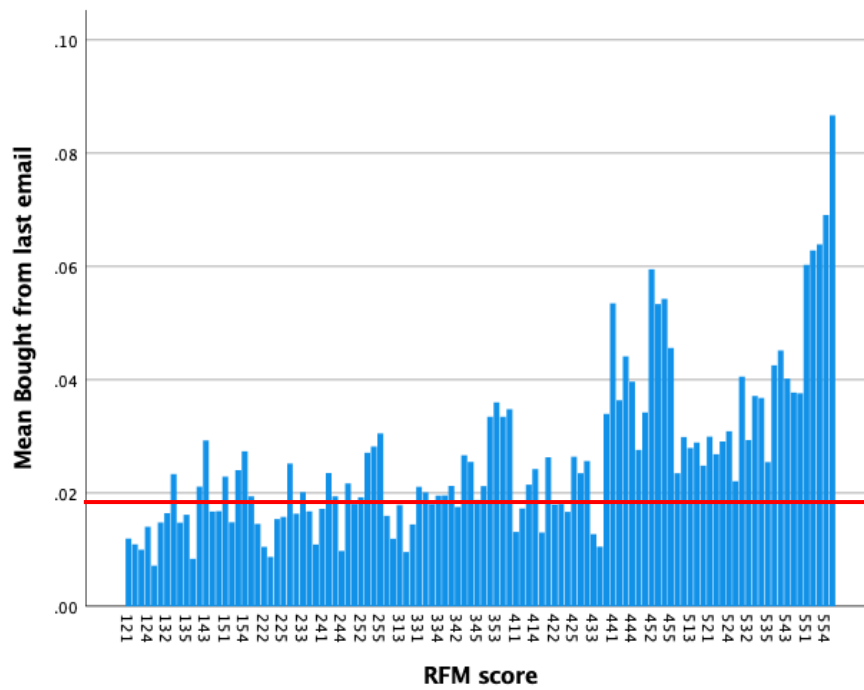
I would recommend targeting bin 555 because they have the highest percentage response from people who responded from the marketing campaign, they also have the highest average dollars spent. I would also target bin 515 because they also have the highest average spent from the last email campaign. Both cells have the highest probability of responding to the marketing campaign and spending more. We know that these two bins are profitable.

8. Assume that the break-even response rate is .0192 or 1.92%. Create a graph of the RFM cells versus the mean purchases from the last email campaign for both RFM methods and draw a line showing the break-even response on the chart.

Independent



Nested



We know that the bins above that line are profitable, bins below that line are not profitable. So, you want to target the ones that are above it.