# Analyzing a Market Test

Plan My Analysis

I am a business analyst for Round Roasters, a coffee restaurant in US. The executive team conducted a market test with new menu and I need to use A/B testing to figure whether the new menu can drive enough sales to offset the cost of marketing the new menu and write up a recommendation.

From the data provided, I picked Store ID, Invoice Number, Invoice Date, Square feet, Average Month Sales, Gross Margin, Sales and Region to do my analysis. The performance metric is Gross_Margin. Test period is 12 weeks from 2016- April- 29 to 2016- July- 21. When I performed the data, I aggregated data at weekly basis.

Clean Up Your Data
Please see below Alteryx workflow and the workflow file.
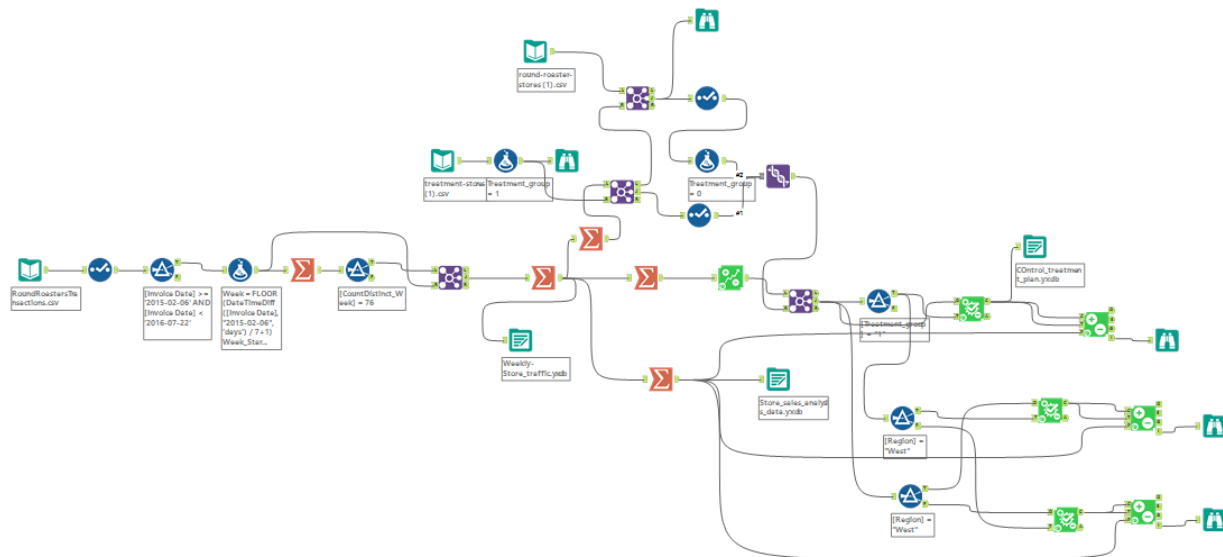
Match Treatment and Control Units
In this step, we need to match treatment and control units. The potential variables are Trend, Seasonality, Square feet, Avgmonthsales and Region. Since our performance metric is Gross Margin, I pick only trend, seasonality, square feet and avgmonthsales to be further investigated. After I did the correlation analysis, it looks only AvgMonthSales has a high correlation with 0.99.

So, for the final test, we only choose trend, seasonality and AveMonthSales as control variables.

Pearson Correlation Analysis

Focused Analysis on Field Sum_Gross.Margin

		Association Measure	p-value
AvgMonthSales		0.990982	0.00000 ***
Sq_Ft		-0.024255	0.78168

Full Correlation Matrix

		Sum_Gross.Margin	Sq_Ft	AvgMonthSales
Sum_Gross.Margin		1.000000	-0.024255	0.990982
Sq_Ft		-0.024255	1.000000	-0.046967
AvgMonthSales		0.990982	-0.046967	1.000000

Matrix of Corresponding p-values

		Sum_Gross.Margin	Sq_Ft	AvgMonthSales
Sum_Gross.Margin			0.78168	0.00000
Sq_Ft		0.78168		0.59138
AvgMonthSales		0.00000	0.59138	

Please see below table for my treatment and control store pairs.

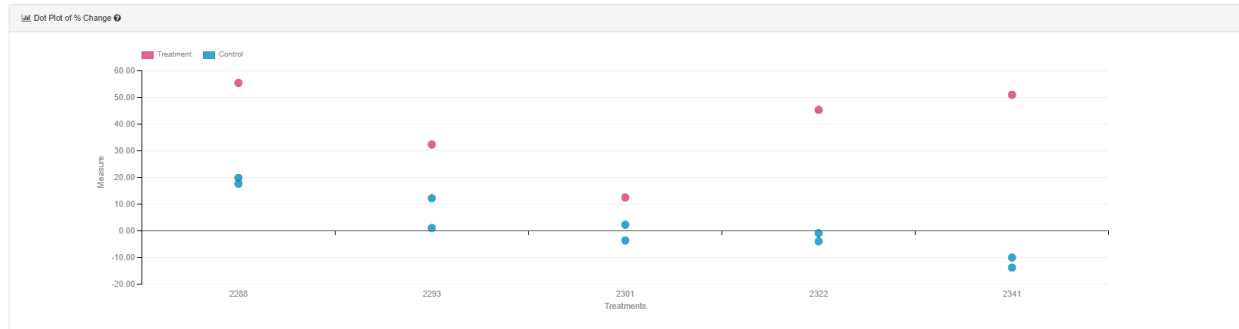| Treatment Store	Control Store 1	Control Store 2
1664	12019	12586
1675	12786	3235
1696	3102	12286
1700	9968	2954
1712	10018	10468
2288	9081	1807
2293	12219	8362
2301	1964	1863
2322	7284	2409
2341	7162	12536

Analysis and Writeup

West region result:
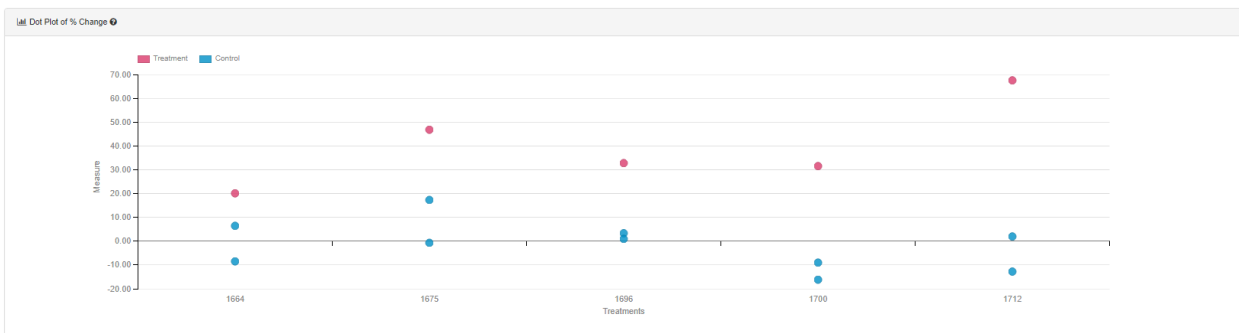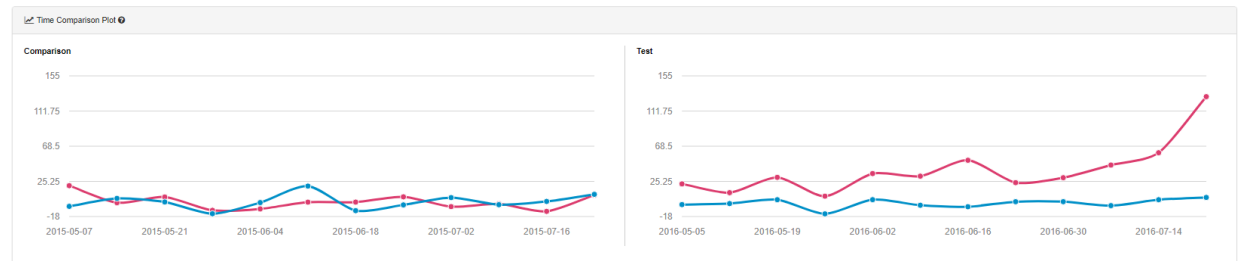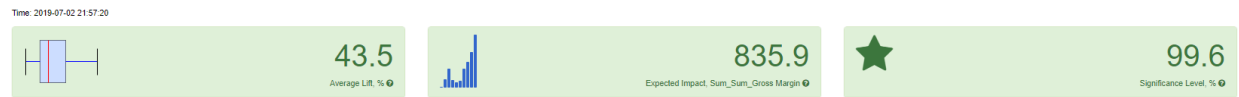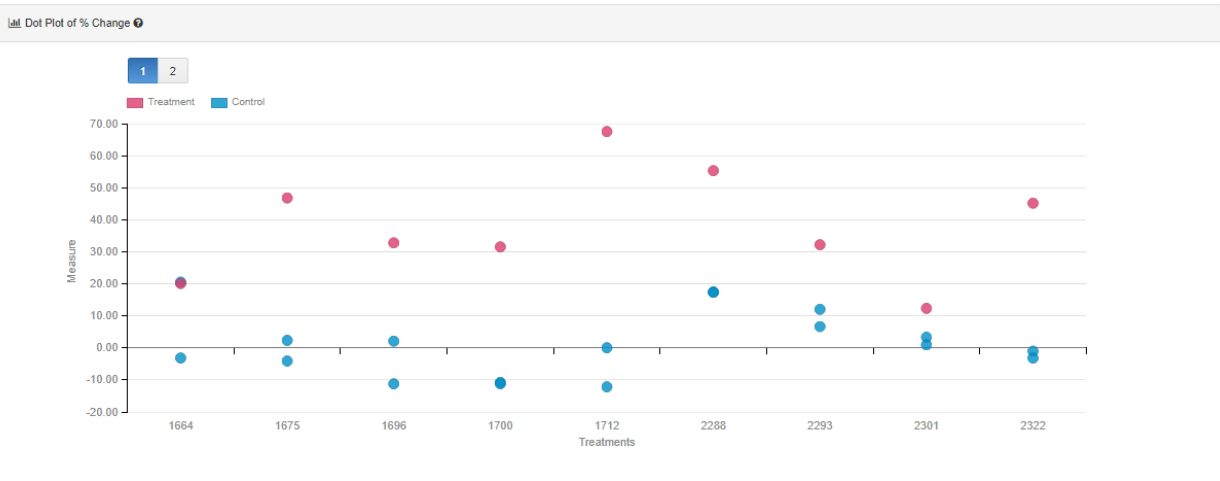
Average lift 37.9% with significance level 99.5%.
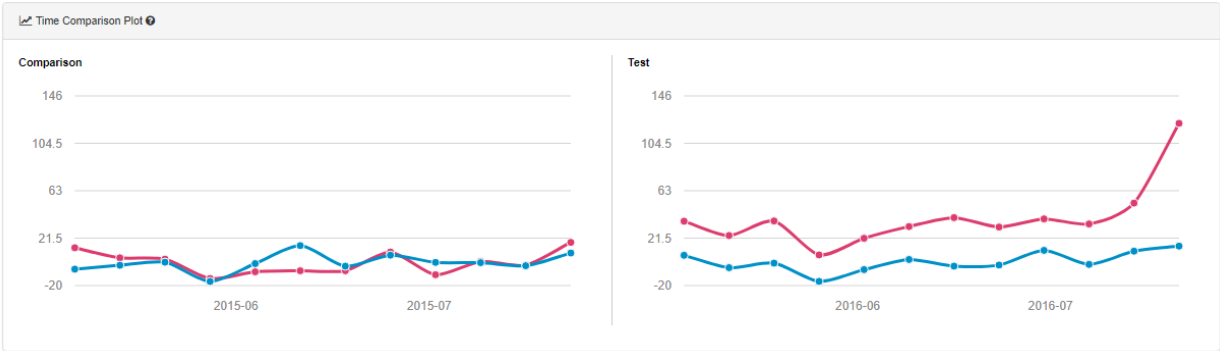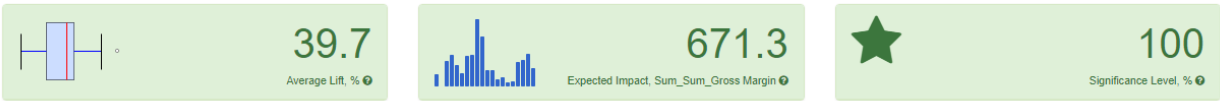
AB Test Analysis for Sum_Sum_Gross Margin
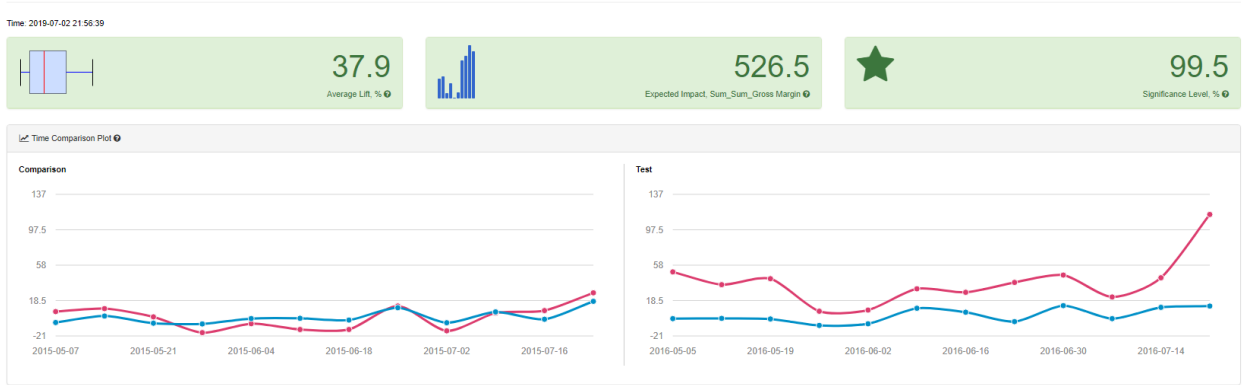
Central region result:
Average lift 43.5% with significance level 99.6%.

AB Test Analysis for Sum_Sum_Gross Margin

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43.5 Average Lift, %	835.9 Expected Impact, Sum_Sum_Gross Margin	99.6 Significance Level, %

Overall result:

Average lift 39.7% with significance level 100%.

AB Test Analysis for Sum_Sum_Gross Margin

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39.7 Average Lift, %	**671.3** Expected Impact, Sum_Sum_Gross Margin	**100** Significance Level, %

Time Comparison Plot

Comparison

146
104.5
63
21.5
-20

2015-06   2015-07

Test

146
104.5
63
21.5
-20

2016-06   2016-07

Dot Plot of % Change

| 1 | 2 |

Treatment   Control

70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
-20.00

1664   1675   1696   1700   1712   2288   2293   2301   2322

Treatments

Measure

Please see above chart as A/B test analysis report.

I will recommend to update menu to all stores as the all 3 number for average lift is above 18% requirement to cover the ads cost.