Project: Analyzing a Market Test(A/B)

Step 1: Plan Your Analysis

1. What is the performance metric you'll use to evaluate the results of your test?

   I will use the increase of sales with gourmet sandwich and limited offer of wines to evaluate the results.

2. What is the test period?

   The test period runs from 29/apr/2019 to 21/jul/2019, total 12 weeks. Test locations are 10 stores in total which 5 stores in each of the test markets.

3. At what level (day, week, month, etc.) should the data be aggregated?

   The data need to be aggregated by week.

Step 2: Clean Up Your Data

Here is the Alteryx file for process: Data aggregation process.yxmd

Step 3: Match Treatment and Control Units

1. What control variables should be considered? Note: Only consider variables in the RoundRoastersStore file.

   As mentioned, I will use region, AvgMonthsSales, Sq ft as control variables.

2. What is the correlation between each potential control variable and your performance metric?

   Full Correlation Matrix

	Sum_Gross.Margin	Sum_Sales	AvgMonthSales
Sum_Gross.Margin	1.00000	0.99853	0.76775
Sum_Sales	0.99853	1.00000	0.76478
AvgMonthSales	0.76775	0.76478	1.00000

   Performance metric is Sum_Gross.Margin. So based on above matrix, sum_sales and sum_Gross.Matrix have high correlation because Multicollinearity. So, I use AvgmonthSales as a control variable.

3. What control variables will you use to match treatment and control stores?

   I will use region (to set two control groups),AvgmonthSales as control variables.

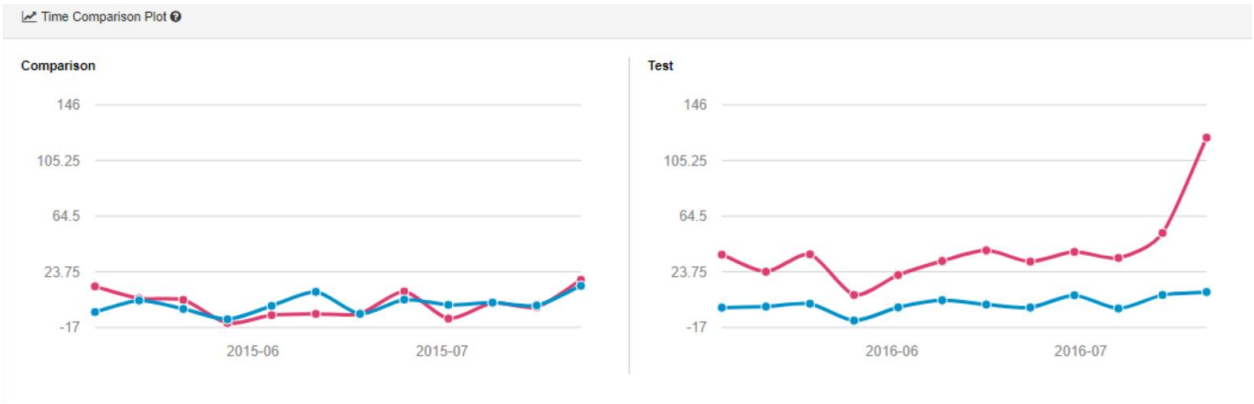
4. Please fill out the table below with your treatment and control stores pairs:

Treatment Store	Control Store 1	Control Store 2
1664	7162	8112
1675	1580	1807
1696	1964	1863
1700	1630	8162
1712	8162	7434
2288	9081	2568
2293	12219	9524
2301	3102	9238
2322	2409	3235
2341	12536	2383

Step 4: Analysis and Writeup

1. What is your recommendation - Should the company roll out the updated menu to all stores?

   In overall, the lift is 40.7% and significance level is 100%. Which is much more than 18%, so changing to new menu with gourmet sandwiches and limited wines offering would gain gross revenue.



Lift Analysis for Sum_Gross Margin

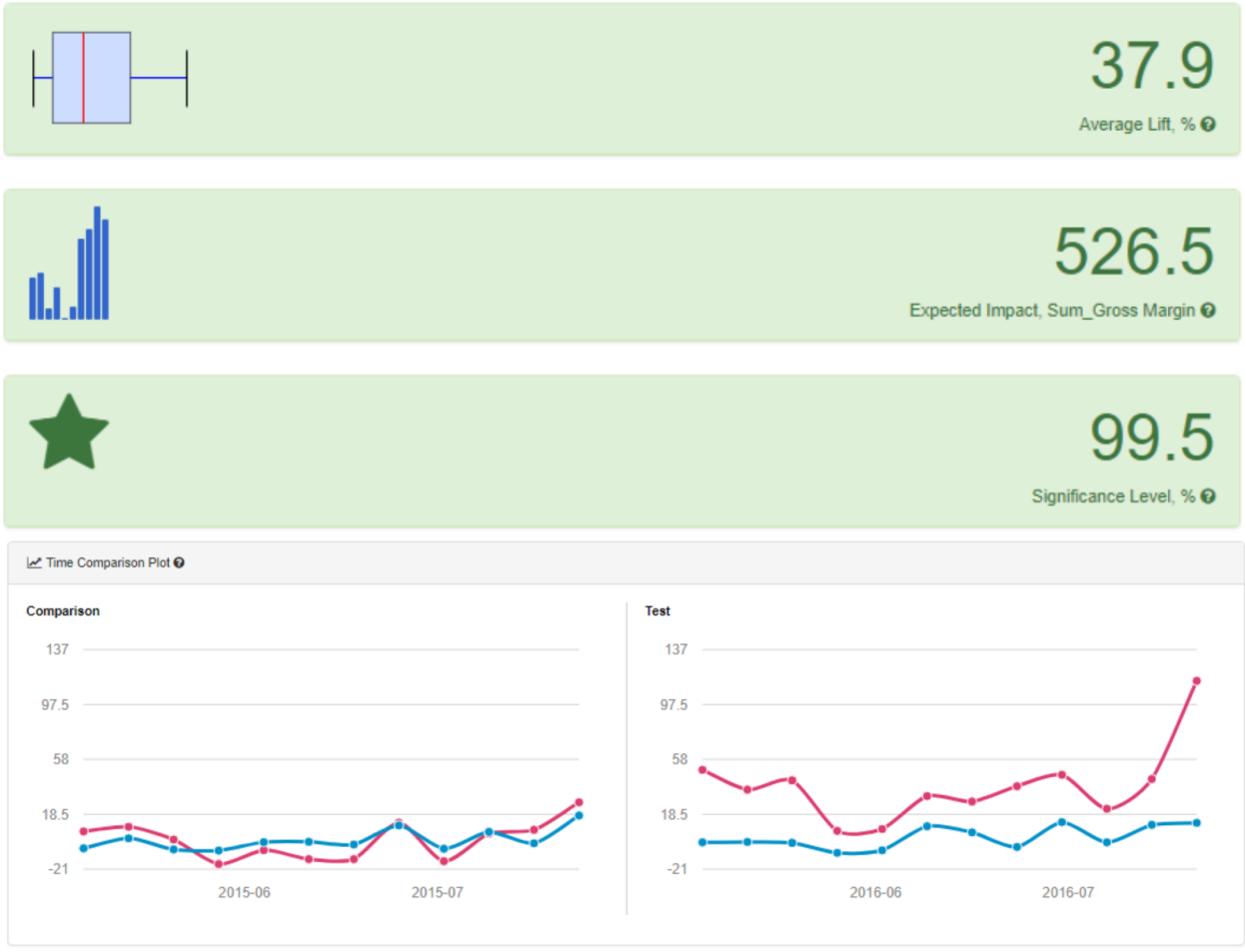
Lift	Expected Impact	Significance Level
40.7%	681	100.0%

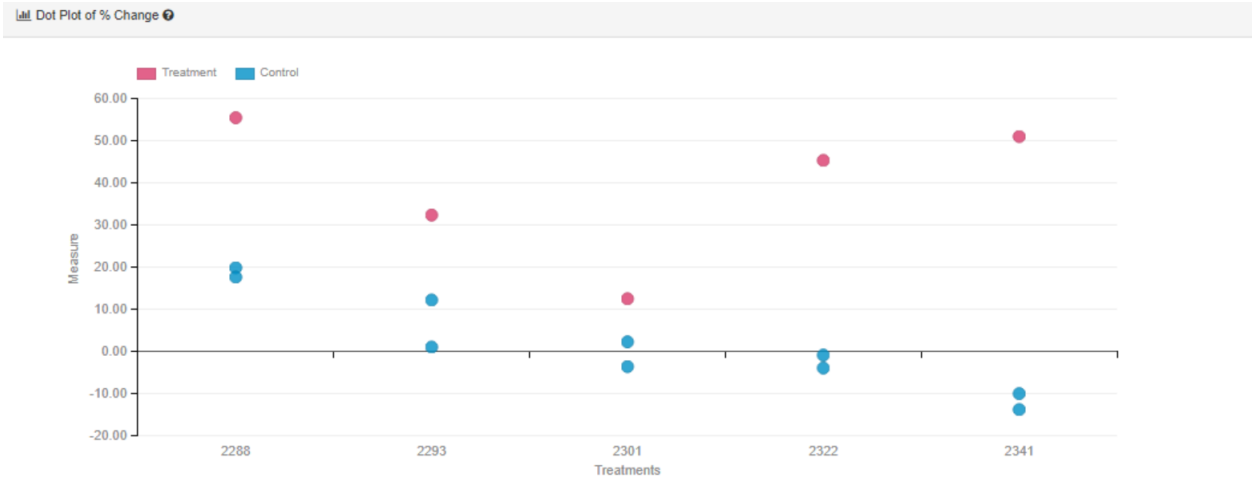
Summary Statistics for Sum_Gross Margin by Test Group

Statistic	Treatment	Control
Average	39.45	0.09
Minimum	12.34	-16.18
Maximum	67.52	19.70
Standard Deviation	16.30	10.54

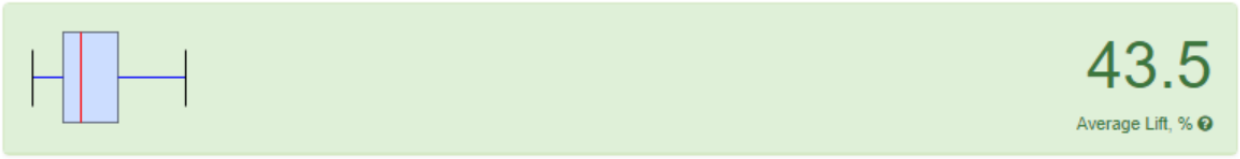
2. What is the lift from the new menu for West and Central regions (include statistical significance)?

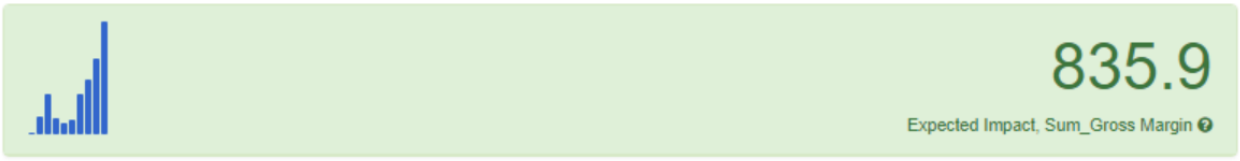
   West region with 37.9% lift and 99.5 significance. (see below)

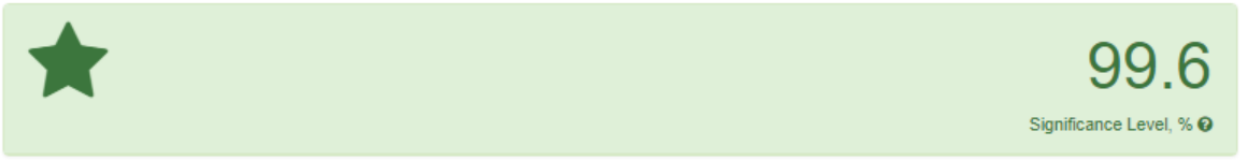


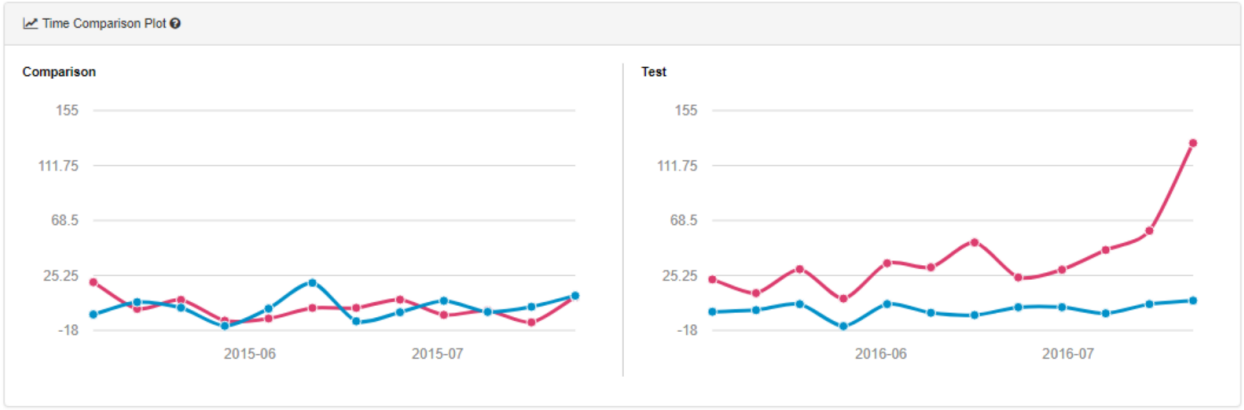


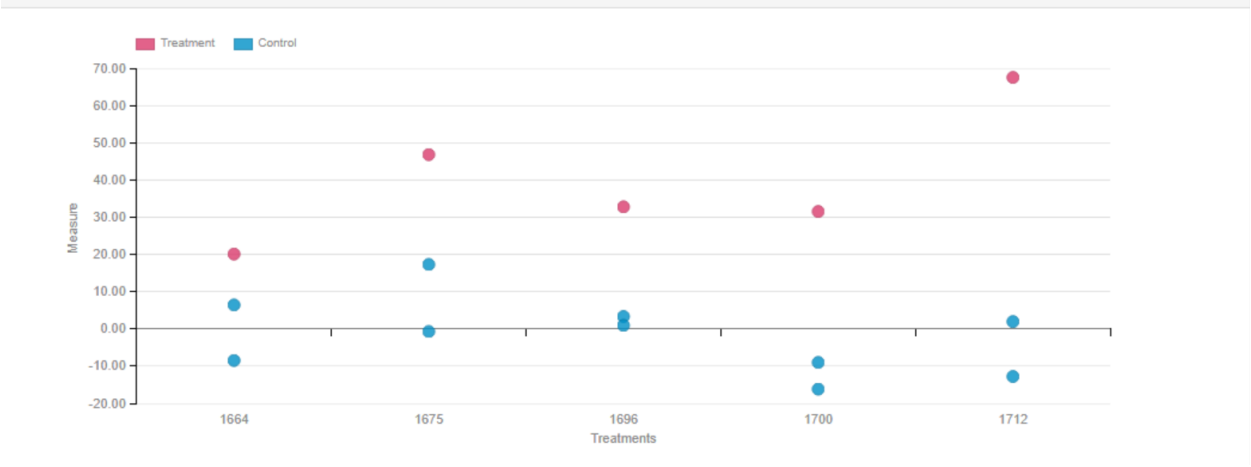
Central region with 43.5% lift, and 99.6 significance.











3. What is the lift from the new menu overall?

   In overall, the lift is 39.4% for the treatment units in the test period relative to the comparison period which is highly statistically significant. (see below)

Test Summary

The average percentage change in Sum_Gross Margin was 39.5% for the treatment units in the test period relative to the comparison period. This same measure was 0.1% for the control units, with the difference between the treatment and control units being 39.4%, which is highly statistically significant. More detailed summary statistics for the treatment and control groups are contained in the first table (which immediately follows), while the details of the hypothesis test of a significant difference in the mean average percentage change in Sum_Gross Margin is contained in a table at the end of this report.

A comparison of the treatment-control pairs indicates an average lift in Sum_Gross Margin for the treatment units over the control units of 40.7%, which results in an expected impact of 681 on Sum_Gross Margin, with 100.0% of the treatment-control pairs exhibiting a positive lift for the treatment units.

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