Project: Analyzing a Market Test

Step 1: Plan Your Analysis

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

The project talks about profitability so the performance metric would be 'Gross Margin'.

2. What is the test period?

The test period was 12 weeks starting from 29-04-2016 to 21-07-2016.

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

The data should be aggregated at week level. We choose 'week level' the experiment ran for 12 weeks which means it aggregated at week level.

Step 2: Clean Up Your Data

I have cleaned up my data to include weekly stores information like foot traffic and weekly gross margin for each store. I have joined this data with the stores information to append region and average monthly sales data.

Step 3: Match Treatment and Control Units

Apart from trend and seasonality...

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

The performance metric we choose is "Gross Margin" so below is a list of potential control variables:

- Average Monthly sales
- Sq_ft which is size of store

I have used the Association analysis tool and the below is the p-values report:

Pearson Correlation Analysis

Focused Analysis on Field Gross_margin

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

Full Correlation Matrix

	Gross_margin	Sq_Ft	AvgMonthSales
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

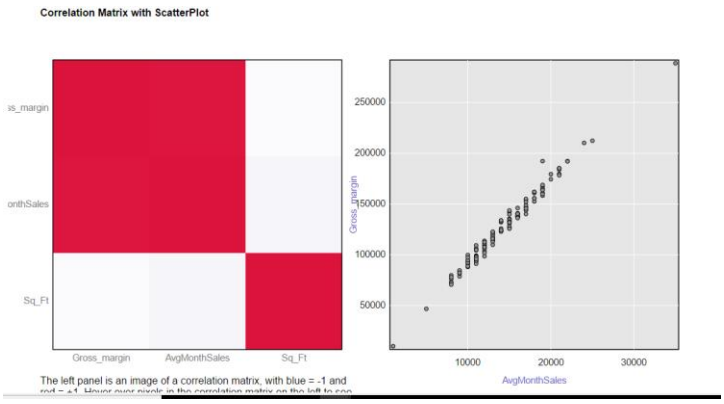
	Gross_margin	Sq_Ft	AvgMonthSales
Gross_margin		0.78168	0.00000
Sq_Ft	0.78168		0.59138
AvgMonthSales	0.00000	0.59138	

Based on the p-values, I conclude that only Average Monthly sales to be the only statistically significant control variable with a p-value of 0.0000 (***).

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

Full Correlation Matrix

	Gross_margin	Sq_Ft	AvgMonthSales
Gross_margin	1.000000	-0.024255	0.990982
Sq_Ft	-0.024255	1.000000	-0.046967
AvgMonthSales	0.990982	-0.046967	1.000000



Based on the report, Average monthly sales is highly correlated with the performance metric ie; gross margin with a correlation of 0.99.

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

Apart from trend and seasonality we need to use 'Average Monthly sales' of each store as a variable when matching treatment and control stores.

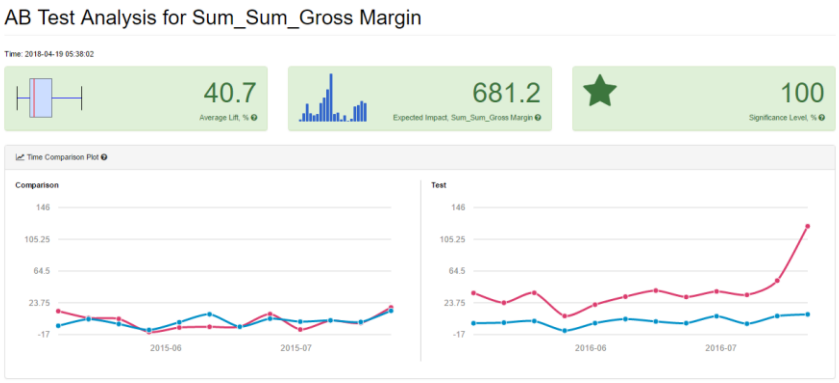
4. Please fill out the table below with your treatment and control stores pairs:

Treatment Store	Control Store 1	Control Store 2
1664	7162	8112
1675	1580	1807
1696	1964	1863
1700	2014	1630
1712	8162	7434
2288	9081	2568
2293	12219	9524
2301	3102	9238
2322	2409	3235
2341	12536	2383

Step 4: Analysis and Write-up

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

The overall average lift in Gross margin for the treatment units during the test period is 40.7% with a 100% statistical significance with an expected impact of $681.20 increase in gross margin.

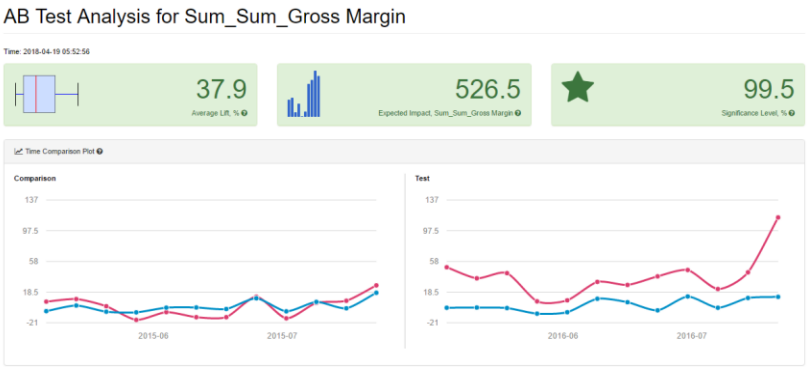


Since there is positive increase in Gross margin which means profitability. In order to be profitable, the predicted impact to gross margin should be at least 18%, here it is 40.7%. Hence we can conclude that the company can roll over the new products as well as hold out a television commercial.

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

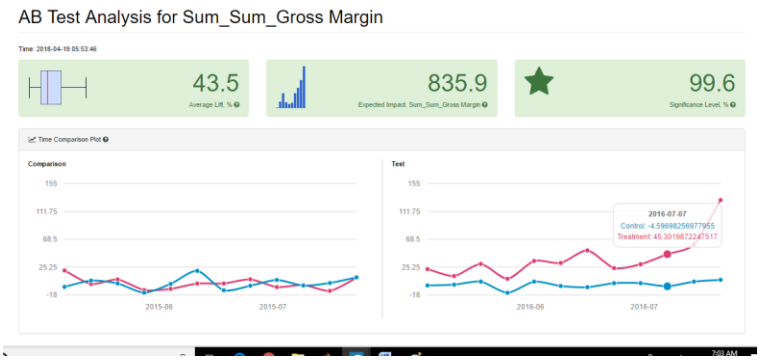
WEST:

The average lift for West region is 37.9% with a statistical significance of 99.5% and the boost in gross margin by $526.50.



CENTRAL:

The average lift for Central region is 43.5% with a statistical significance of 99.6% and a boost in gross margin by $835.90.



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

The overall average lift in Gross margin for the treatment units during the test period is 40.7% with a 100% statistical significance with an expected impact of $681.20 increase in gross margin.