

# 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?  
Sum of gross margin will be used to decide whether new menu and limited wine offerings should be introduced.
2. What is the test period?  
A period of 12 weeks (29-Apr-16 to 21-Jul-16) is used as test period.
3. At what level (day, week, month, etc.) should the data be aggregated?  
The data should be aggregated at weekly level.

## Step 2: Clean Up Your Data

RoundRoasterTransaction and Round-Roaster-Store datasets are first combined. 76 weeks data (6-Feb-15 to 21-Jul-16) is used as A/B test requires 52 weeks of data in addition to a minimum of 12 weeks needed to calculate seasonality and for the period of testing each. 12 weeks is used instead of 6 weeks in this case as the test period lasted for 12 weeks.

The week, \_weekbegin, \_weekend and \_NewProductFlag are added to calculate the weekly traffic and sales for each store. Treatment\_Store dataset is then introduced to create a list of control and treatment stores.

## Step 3: Match Treatment and Control Units

1. What control variables should be considered? Note: Only consider variables in the RoundRoastersStore file.  
AvgMonthSales should be considered as constant variable while Square Feet should be ignored.
2. What is the correlation between your each potential control variable and your performance metric?  
From the Pearson Correlation Analysis, AvgMonthSales has high correlation of 0.99 with the performance metric, i.e. Sum of Gross Margin. On the other hand, Square Feet has a poor correlation of -0.05.

## Pearson Correlation Analysis

*Full Correlation Matrix*

	Sum_Sum_Gross.Margin	AvgMonthSales	Sq_Ft
Sum_Sum_Gross.Margin	1.000000	0.990978	-0.024224
AvgMonthSales	0.990978	1.000000	-0.046967
Sq_Ft	-0.024224	-0.046967	1.000000

- What control variables will you use to match treatment and control stores?  
AvgMonthSales will be used together with Trend and Seasonality when matching treatment and control stores.
- Please fill out the table below with your treatment and control stores pairs:

Treatment Store	Control Store 1	Control Store 2
1664	1964	8562
1675	1807	7584
1696	1863	7334
1700	7037	1508
1712	8162	7434
2288	2568	9081
2293	12219	9639
2301	11668	12019
2322	9238	9388
2241	2572	3102

## Step 4: Analysis and Writeup

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

The company should roll out the updated menu to all stores as the sum of profit margin increased by more than 18%, from \$17,978.67 per store to \$26,687.45 per store during test period.

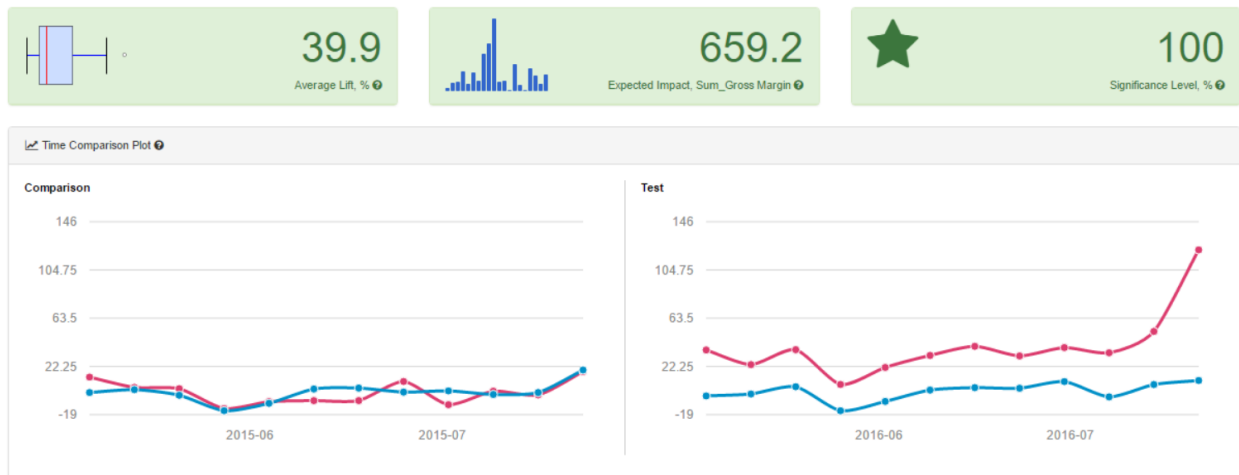
2. What is the lift from the new menu for West and Central regions (include statistical significance)?

The lift for West region is 36.6% while the lift for Central region is 43.2% and both have a statistical significance of 99.5% and 100% respectively.

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

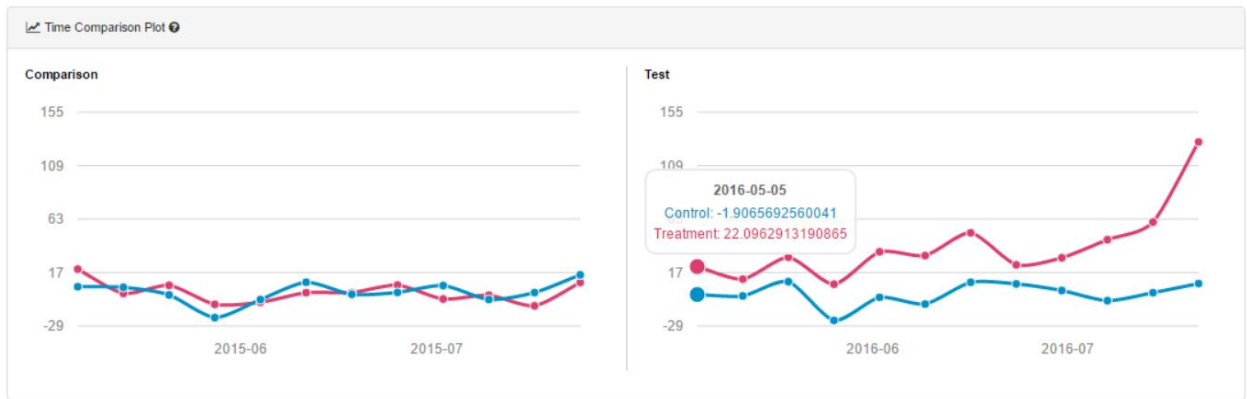
The lift for the new menu overall is 43.2% with a statistical significance of 99.6%.

### West Region

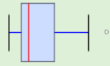




## Central Region



## Overall Region



39.9  
Average Lift, % ⓘ



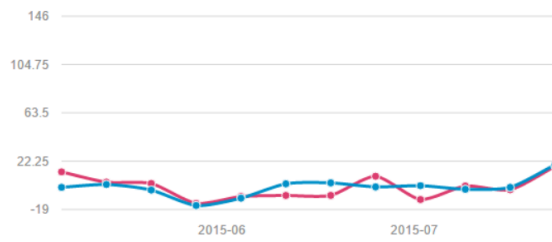
659.2  
Expected Impact, Sum\_Gross Margin ⓘ



100  
Significance Level, % ⓘ

Time Comparison Plot ⓘ

Comparison



Test

