

# Project 5: Analyzing a Market Test

## Project Overview

You're a business analyst for Round Roasters, a coffee restaurant in the United States of America. The executive team conducted a market test with a new menu and needs to figure whether the new menu can drive enough sales to offset the cost of marketing the new menu. Your job is to analyze the A/B test and write up a recommendation to whether the Round Roasters chain should launch this new menu.

## Step 1: Plan Your Analysis

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

The sum of gross margin will be used as a performance metric to evaluate whether to introduce gourmet sandwiches and limited wine offerings at all the stores.

2. What is the test period?

A period of 12 weeks (2016-April-29 to 2016-July-21)

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

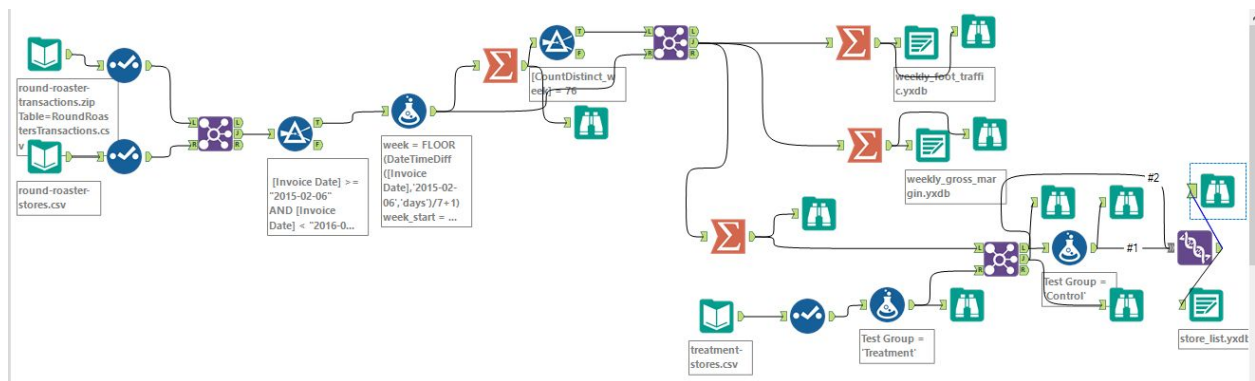
Data should be aggregated at weekly level.

## Step 2: Clean Up Your Data

RoundRoasterTransactions and Round-Roaster-Stores data is combined.

76 weeks data (6-Feb-15 to 21-Jul-16) is gathered for all stores.

*The week, week\_start, week\_end* are added to calculate the weekly foot traffic and weekly gross margin for each store. Test Group column is added to classify treatment and control stores. Treatment-Stores dataset is then introduced to create a list of control and treatment stores.



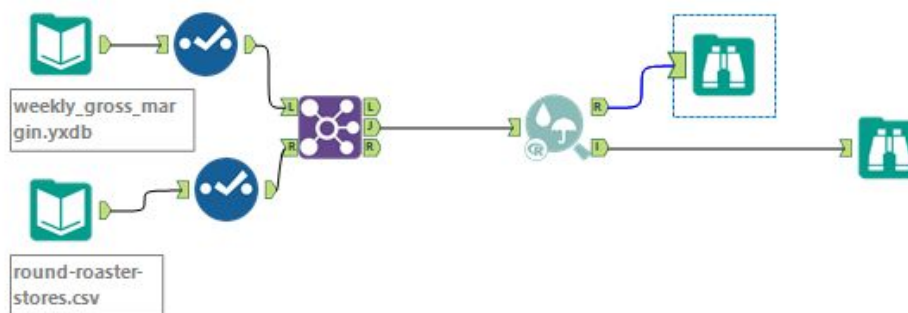
## Step 3: Match Treatment and Control Units

1. What control variables should be considered?

AvgMonthSales, Trend, Seasonality and Sq\_ft are potential control variables.

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

Association Analysis is performed, *AvgMonthSales* has high correlation with the performance metric, i.e. Sum of Gross Margin. *Sq\_ft* has a poor correlation with the performance metric.



## Pearson Correlation Analysis

Full Correlation Matrix

	Sum_Gross.Margin	Sq_Ft	AvgMonthSales
Sum_Gross.Margin	1.000000	-0.019345	0.790358
Sq_Ft	-0.019345	1.000000	-0.046967
AvgMonthSales	0.790358	-0.046967	1.000000

Matrix of Corresponding p-values

	Sum_Gross.Margin	Sq_Ft	AvgMonthSales
Sum_Gross.Margin		5.1796e-02	0.0000e+00
Sq_Ft	5.1796e-02		2.3119e-06
AvgMonthSales	0.0000e+00	2.3119e-06	

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

*AvgMonthSales*, Trend and Seasonality are used when matching treatment and control stores. *Sq\_ft* is ignored due to poor correlation.

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

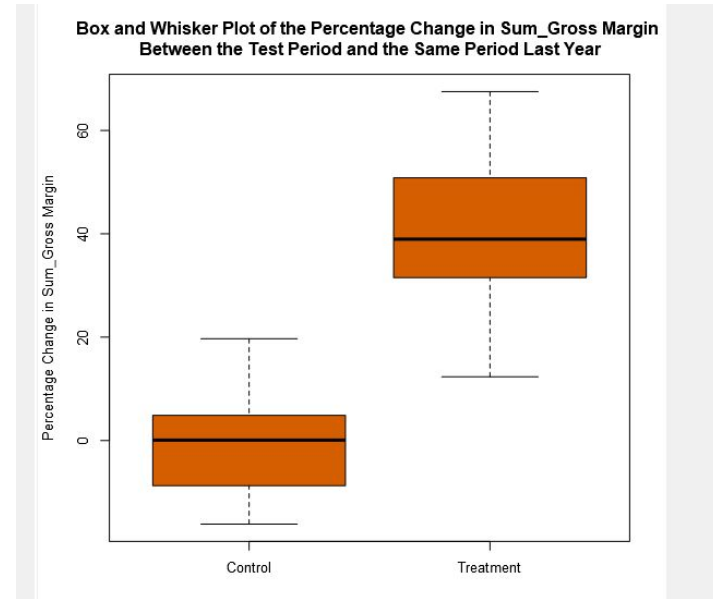
## Step 4: Analysis and Writeup

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

The company should roll out the new menu to all the stores due to 40% overall lift at a significance of 100%.

### Lift Analysis for Sum\_Gross Margin

Significance Level	Lift	Expected Impact
100.0%	40.7%	681
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



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

The lift for West region is 37.9% while the lift for Central region is 43.5% and both have a statistical significance of 99.5% and 99.6% respectively.

### West Region

#### Lift Analysis for Sum\_Gross Margin

Significance Level	Lift	Expected Impact
99.5%	37.9%	527
Summary Statistics for Sum_Gross Margin by Test Group		
Statistic	Treatment	Control
Average	39.17	1.92
Minimum	12.34	-13.96
Maximum	55.30	19.70
Standard Deviation	16.34	11.24

### Central Region

### Lift Analysis for Sum\_Gross Margin

Significance Level	Lift	Expected Impact
99.6%	43.5%	836

#### Summary Statistics for Sum\_Gross Margin by Test Group

Statistic	Treatment	Control
Average	39.74	-1.73
Minimum	20.09	-16.18
Maximum	67.52	17.29
Standard Deviation	17.15	10.03

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

The lift for the new menu overall is 40.7% with a statistical significance of 100%

#### Lift Analysis for Sum\_Gross Margin

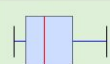
Significance Level	Lift	Expected Impact
100.0%	40.7%	681

#### 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

### West Region A/B Analysis

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37.9

Average Lift, %



526.5

Expected Impact, Sum\_Gross Margin

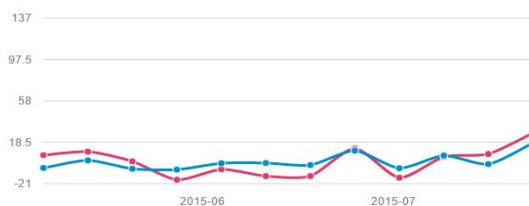


99.5

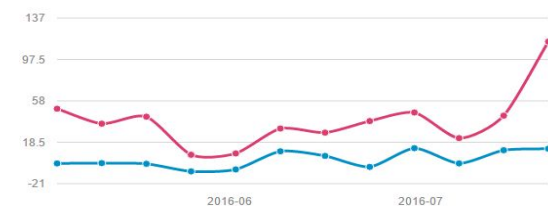
Significance Level, %

Time Comparison Plot

Comparison

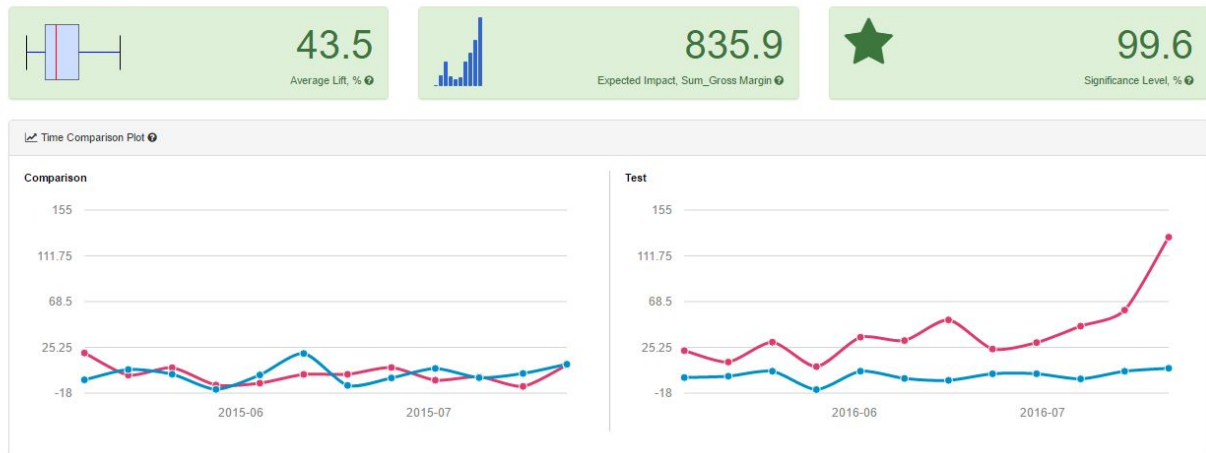


Test



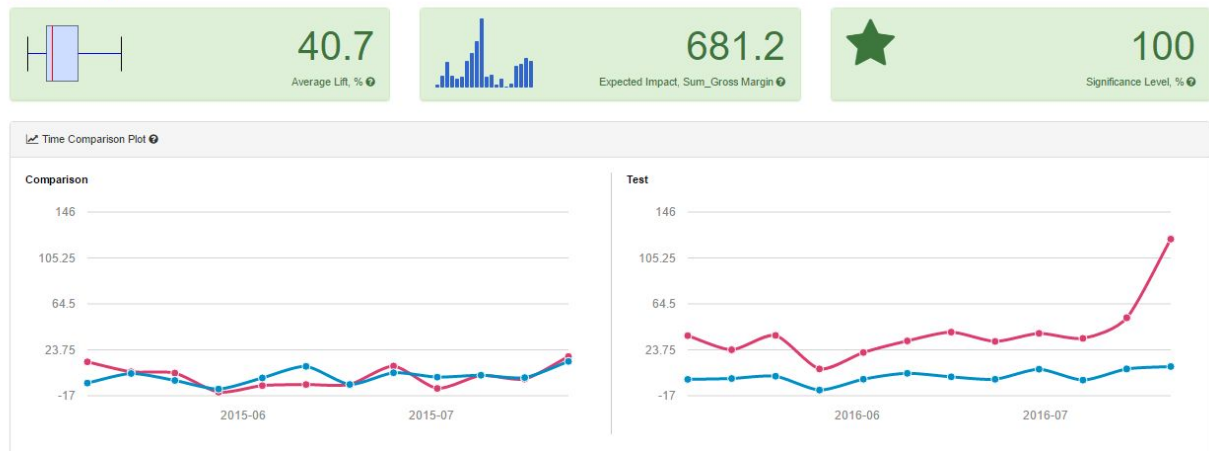
### Central Region A/B Analysis

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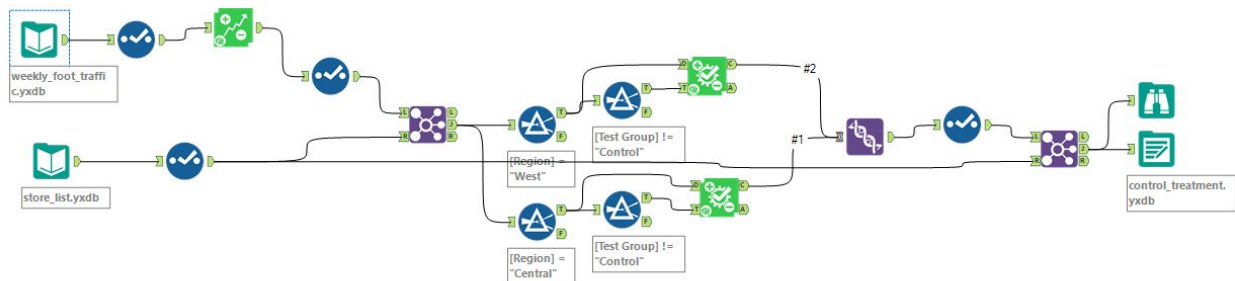
## Overall

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## Alteryx Workflow

### Treatment and Control Store Matching



## A/B Analysis

