

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?
At least 18% increase in profit growth compared to the comparative period while compared to the control stores for launching a new sandwich menu and tv advertisement.
2. What is the test period?
The test period should be in total 12 weeks, which is 2016-April-29 to 2016-July-21.
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

For the project, we need to use 12 weeks to calculate trend, so we need 52 weeks (1 year) +12=64 weeks of data prior to the test start date. Since the test lasts for 12 weeks, this means we need a total 76 weeks of data. So the start date should be 2015-02-06 to 2016-07-21 to meet needs of 76 weeks of data.

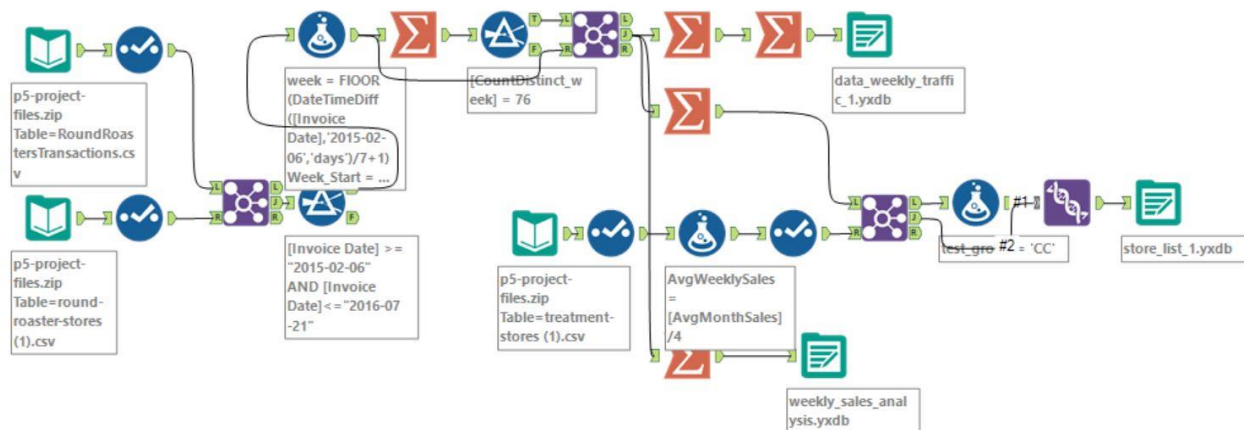


Figure 1. Workflow for Cleaned Up Data

Step 3: Match Treatment and Control Units

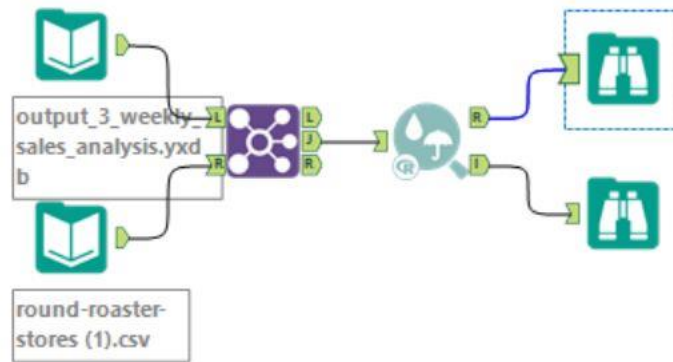


Figure 2. Associate Analysis Workflow

Pearson Correlation Analysis

Full Correlation Matrix

	Sum_Gross.Margin	Sum_Sales	Sq_Ft	AvgMonthSales
Sum_Gross.Margin	1.000000	0.998666	-0.019345	0.790358
Sum_Sales	0.998666	1.000000	-0.022036	0.788317
Sq_Ft	-0.019345	-0.022036	1.000000	-0.046967
AvgMonthSales	0.790358	0.788317	-0.046967	1.000000

Matrix of Corresponding p-values

	Sum_Gross.Margin	Sum_Sales	Sq_Ft	AvgMonthSales
Sum_Gross.Margin		0.0000e+00	5.1796e-02	0.0000e+00
Sum_Sales	0.0000e+00		2.6726e-02	0.0000e+00
Sq_Ft	5.1796e-02	2.6726e-02		2.3119e-06
AvgMonthSales	0.0000e+00	0.0000e+00	2.3119e-06	

Figure 3. Pearson Correlation Analysis Report

- What control variables should be considered?
From figure 3, except sum_Gross_margin and Sum_sales are highly correlated, AvgMonthSales is highly correlated with sum gross margin and sum sales too, but not the Sq_Ft.
- What is the correlation between your each potential control variable and your performance metric?
From figure 3, the correlation of the control variable and performance metric is 0.79
- What control variables will you use to match treatment and control stores?
The control variable I will use to match treatment and control stores is AvgMonthSales.
- Please fill out the table below with your treatment and control stores pairs:

Treatment Store	Control Store 1	Control Store 2
1664	1857	7484
1675	2114	8562
1696	1964	7584
1700	1508	7384
1712	7284	8212
2288	9081	12069
2293	11568	12219
2301	10018	10468
2322	2409	3102
2341	2333	11368

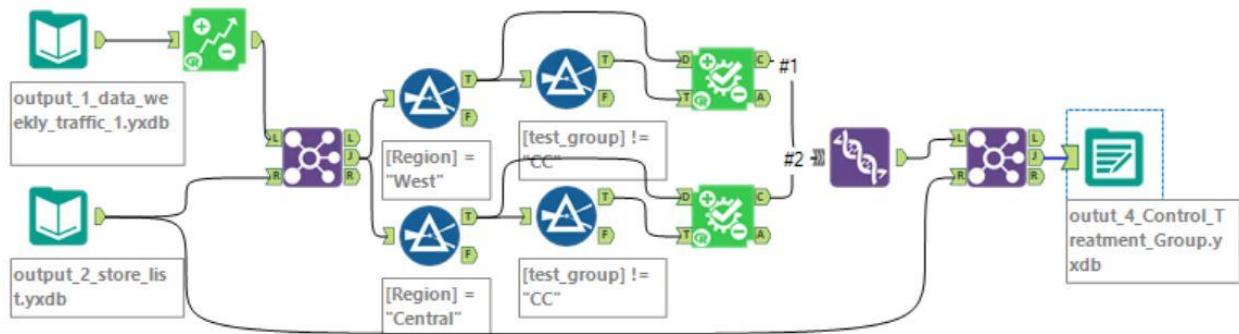


Figure 4. Workflow for Creating the Control and Treatment Group

Step 4: Analysis and Writeup

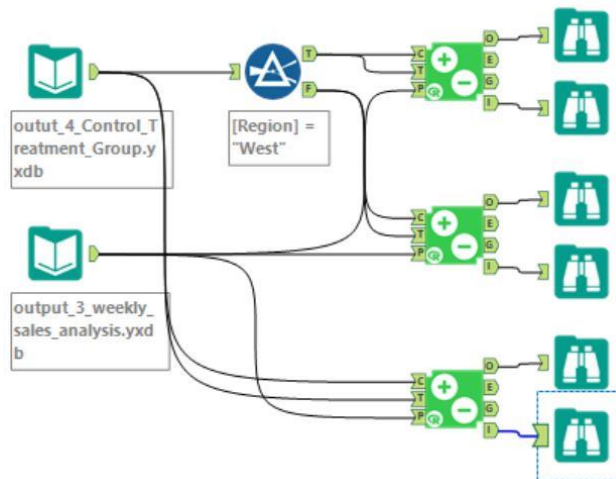


Figure 5. Workflow for the AB Analysis

AB Test Analysis for Sum_Gross Margin

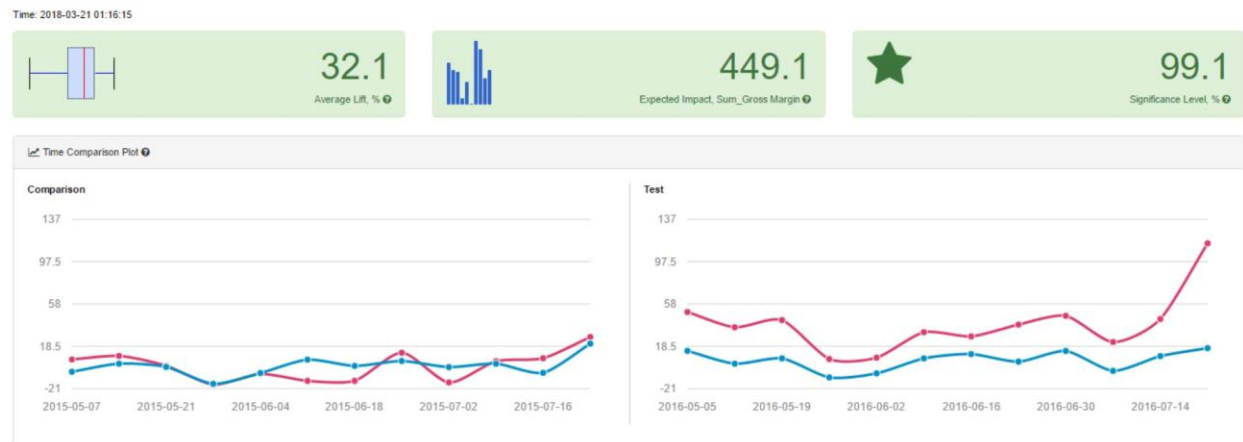


Figure 6. AB Test Analysis for the West

AB Test Analysis for Sum_Gross Margin

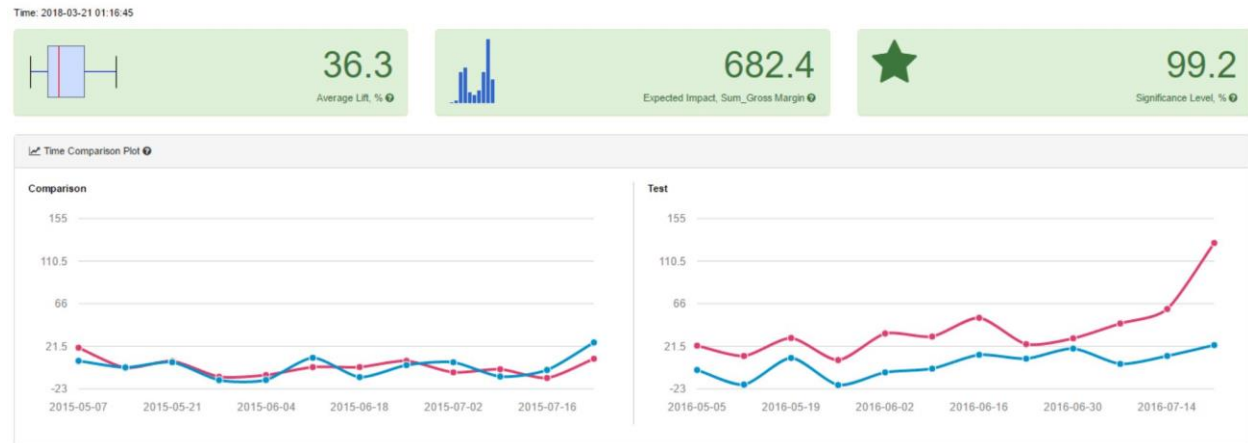


Figure 7. AB Test Analysis for the Central

AB Test Analysis for Sum_Gross Margin

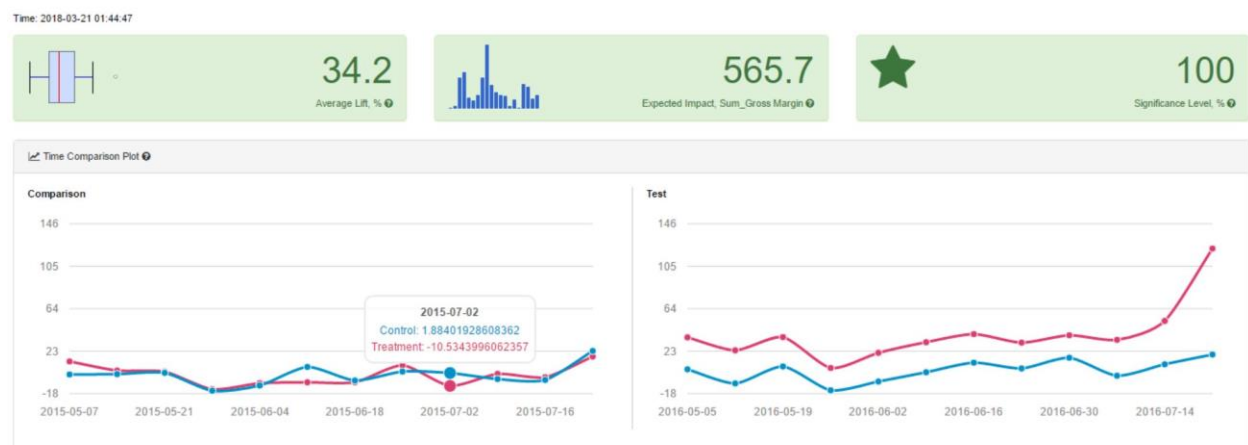


Figure 8. AB Test Analysis Overall

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

My recommendation is the company should roll out the updated menu to all stores, since the gross margin lift for the West and Central region, also the overall gross margin lift are more than 18%.

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

For the West region (figure 6) the lift is 32.1%, for the Central region (figure 7) the lift is 36.3%

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

From the figure 8, the overall lift from the new menu is 34.2%