A/B Test a New Market Launch

Step 1: Plan Your Analysis

To perform the correct analysis, you will need to prepare a data set. (500 word limit)
Answer the following questions to help you plan out your analysis:

1. What is the performance metric you'll use to evaluate the results of your test?
   The performance metric used to evaluate the results of the test will be gross margin. An increase in gross margin over the treatment stores should indicate a successful test of the new products and determine if the store should expand the new menu to all stores.
2. What is the test period?
   The test period is a 12-week period extending from April 29th through July 21st 2016.
3. At what level (day, week, month, etc.) should the data be aggregated?
   For this analysis the data will be aggregated at the weekly level given that the test period is in weeks.

Step 2: Clean Up Your Data

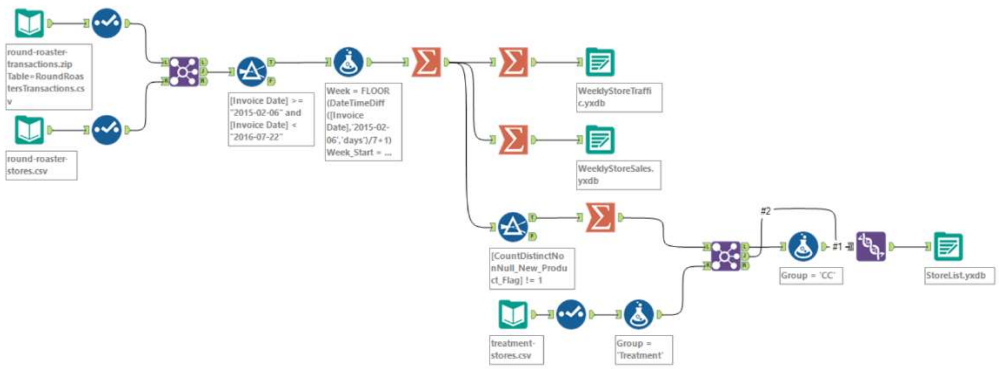


Figure 1: Data Clean – up Workflow

The following steps were used in data clean up:

- Join transaction data with store data
- Identify number of weeks of historical and test data needed
  - 12 weeks test + 12 weeks (1 additional period) + 52 weeks = 76 weeks of total data
- Filter out unnecessary weeks of data
- Create new fields for week start and end dates
- Create a new field for a new product flag
- Summarize weekly store traffic
- Summarize weekly store sales
- Add treatment and control variables for paring

Step 3: Match Treatment and Control Units

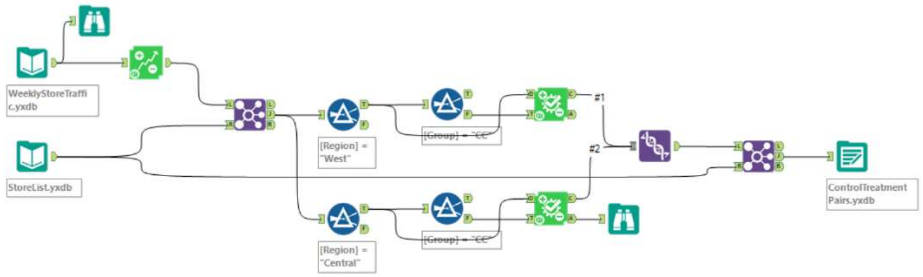


Figure 2: Treatment and Control Pairs Workflow

Apart from trend and seasonality...

1. What control variables should be considered?
   The numeric variables in the round roasters stores file that will be considered against the performance metric gross margin are:
   - AvgMonthSales
   - Sq_Ft
2. What is the correlation between your each potential control variable and your performance metric?

Full Correlation Matrix

	Sum_Gross.Margin	Sq_Ft	AvgMonthSales
Sum_Gross.Margin	1.000000	-0.020353	0.988219
Sq_Ft	-0.020353	1.000000	-0.046967
AvgMonthSales	0.988219	-0.046967	1.000000

Figure 3: Association Analysis

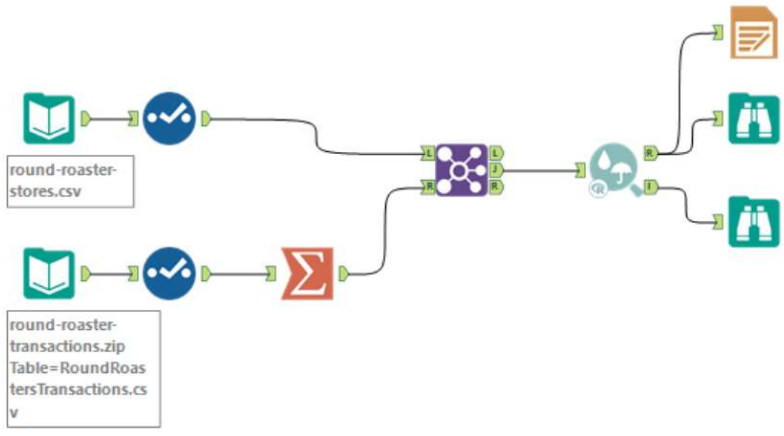


Figure 4: Association Analysis Workflow

3. What control variables will you use to match treatment and control stores?
   The correlation matrix from the association analysis shows a high correlation between average monthly sales and gross margin and very low correlation between store size and gross margin. Therefore, we will utilize the average monthly sale variable along with seasonality and trend to match the treatment and control store.

4. 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
2241	2333	11368

Step 4: Analysis and Writeup

Conduct your A/B analysis and create a short report outlining your results and recommendations. (250 words limit)

Answer these questions. Be sure to include visualizations from your analysis:

1. What is your recommendation - Should the company roll out the updated menu to all stores?
   Yes, the company should roll out the new menu across all stores as the new menu significantly increased gross margin. Below are the results of the analysis for the Central and West regions independently.

Figure 5: Central Region Analysis

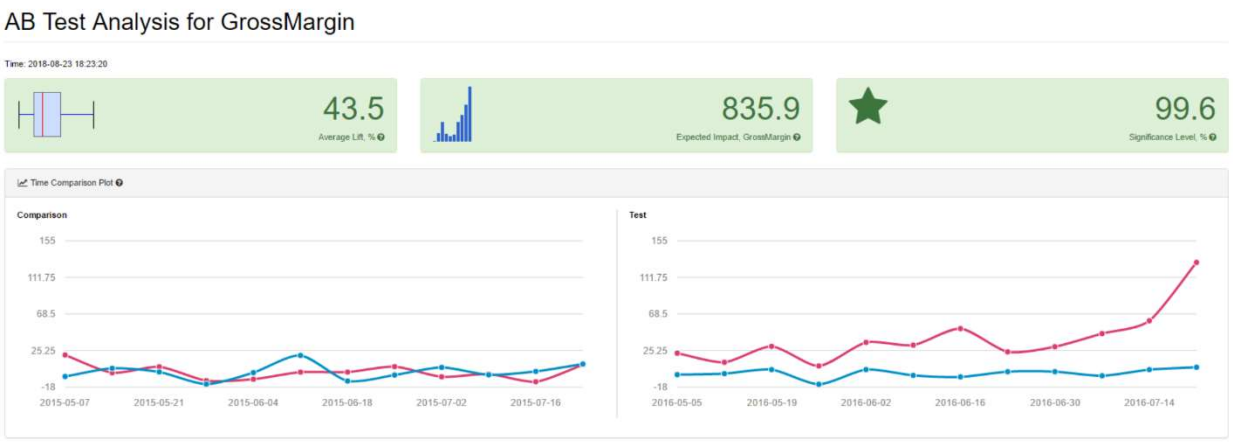
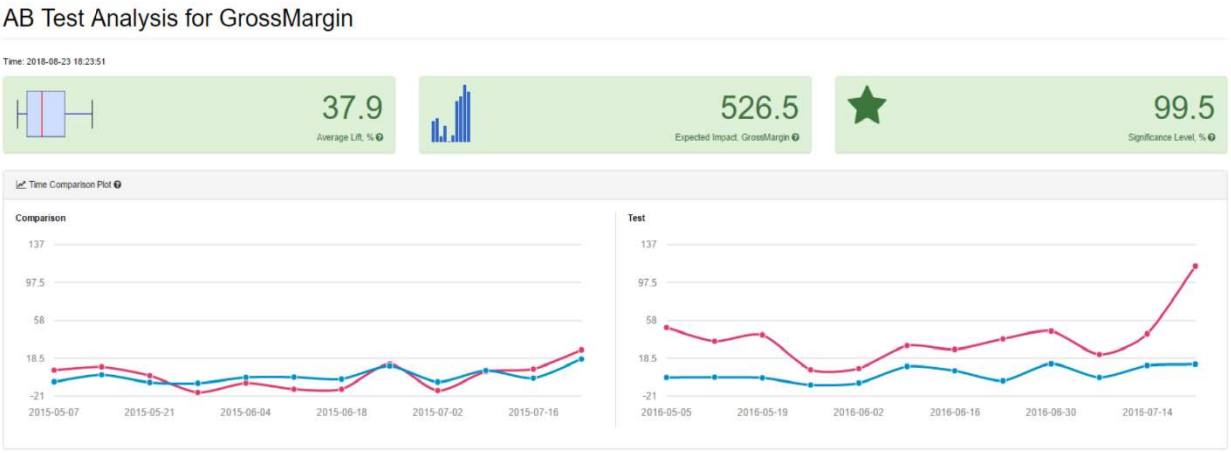


Figure 6: West Region Analysis



2. What is the lift from the new menu for West and Central regions (include statistical significance)?
   The lift achieved in each region is listed below along with its statistical significance:
   - Central Region – lift is 43.5 with a significance of 99.6%
   - West Region – lift is37.9 with a significance of 99.5%

3. What is the lift from the new menu overall?
   The overall lift of the new menu is 40.7.

Figure 7: Overall Analysis