



# NEW MENU LAUNCH

A/B Testing

## *TABLE OF CONTENTS*

<b>TABLE OF CONTENTS</b> .....	1
<b>AB TEST NEW MENU LAUNCH</b> .....	2
Business and Data Understanding .....	2
Planning the Analysis .....	2
Data Clean-Up.....	3
Match Treatment and Control Units .....	4
Analysis and Conclusion.....	5
West Region Summary.....	5
Central Region Summary .....	6
Overall Summary.....	7
Alteryx Workflows .....	8
Resources.....	9
Websites.....	<b>Error! Bookmark not defined.</b>
Udacity Knowledge .....	9

## AB TEST NEW MENU LAUNCH

### Business and Data Understanding

An upscale coffee chain located in the western United States of America has seen stagnant growth in the past few years, and new management team was put in place to reignite the growth. The management team would like to conduct a market test to see if the new menu changes would reignite growth.

Two cities have been chosen with new television for the new change, with new television advertising. Denver and Chicago. These were chosen as the stores perform similarly to all stores throughout the entire chain of stores and would be a good proxy to predict how well the updated menu performs with the addition of gourmet sandwiches and limited wine offerings.

You've been asked to analyse the results of the experiment to determine whether the menu changes should be applied to all stores. The predicted impact to profitability should be enough to justify the increased marketing budget: at least 18% increase in profit growth compared to the comparative period while compared to the control stores; otherwise known as *incremental lift*.

### Planning the Analysis

The **Gross Margin** is the chosen performance matrix to use to evaluate the test results. By predicting the profitability, we can justify the increased marketing budget: at least 18% increase in profit growth compared to the comparative period while compared to the control stores; otherwise known as *incremental lift*.

The test ran for a period of 12 weeks (2016-April-29 to 2016-July-21) where five stores in each of the test markets offered the updated menu along with television advertising. Our data should be aggregated at week level.

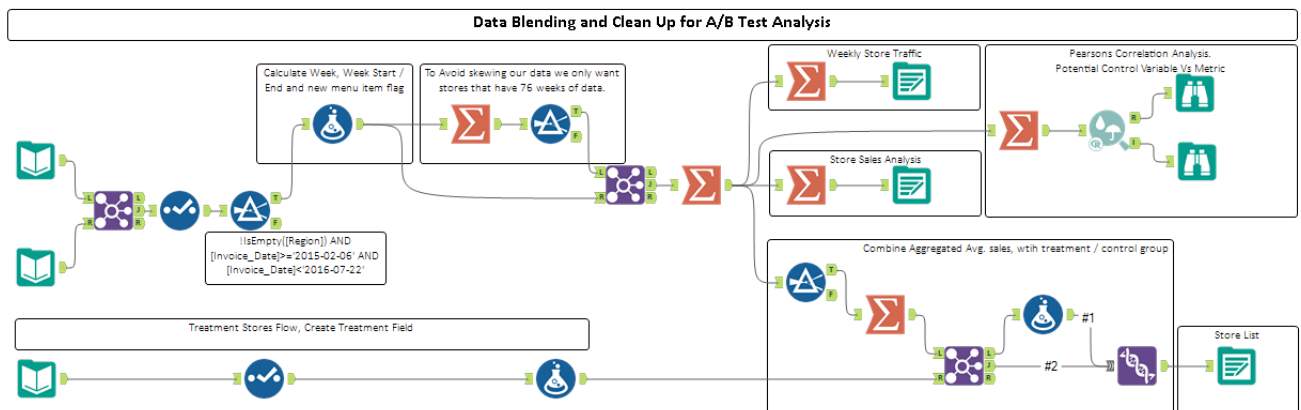
Data that has been collected to use in the analysis:

- Transaction data for all stores from 2015-January-21 to 2016-August-18.
- A listing of all Round Roasters stores.
- A listing of the 10 stores (5 in each market) that were used as test markets.

## Data Clean-Up

- Weekly store traffic data for A/B Trend Tool: Produces our seasonality and trends indices to help us match our treatment and control stores.
- Store list data for A/B Controls tool: Produces which control stores to match with our treatment stores along with results from the A/B Trends Tool
- Store sales analysis data for A/B Analysis tool: Produces the results.

For the Data blending, joined Store Data with Transaction Data. Next, then apply filters to the data so we have 76 weeks of data between 6-February-2015 and 21-July-2016. AS A/B test requires 52 in addition to the test weeks to check for seasonality for the period of testing. Also take this opportunity to filter out data where region field is blank. Also, we create a flag if the transaction is one of the new offering's gourmet sandwich or wine.



## Match Treatment and Control Units

Control variables that should be considered from Round Roasters Store file are:

AvgMonthSales and Sq\_Ft (square feet) should be considered to compare against the performance metric.

Below is the Pearson Correlation Analysis of the two variables, against the performance metric Gross\_Margin.

The statistically significant variable is the AvgMonthSales, with a p-value <0.05, and high correlation of .99 against the performance matrix. Sq\_Ft has poor correlation with a score of -0.04.

### Pearson Correlation Analysis

#### Full Correlation Matrix

	AvgMonthSales	Sq_Ft	Sum_Gross_Margin
AvgMonthSales	1.000000	-0.046967	0.990982
Sq_Ft	-0.046967	1.000000	-0.024255
Sum_Gross_Margin	0.990982	-0.024255	1.000000

#### Matrix of Corresponding p-values

	AvgMonthSales	Sq_Ft	Sum_Gross_Margin
AvgMonthSales		0.59138	0.00000
Sq_Ft	0.59138		0.78168
Sum_Gross_Margin	0.00000	0.78168	

Control variables that should be considered are AvgMonthSales along with Trend and Seasonality when we match Treatment and Control Stores

#### Treatment and Control store 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

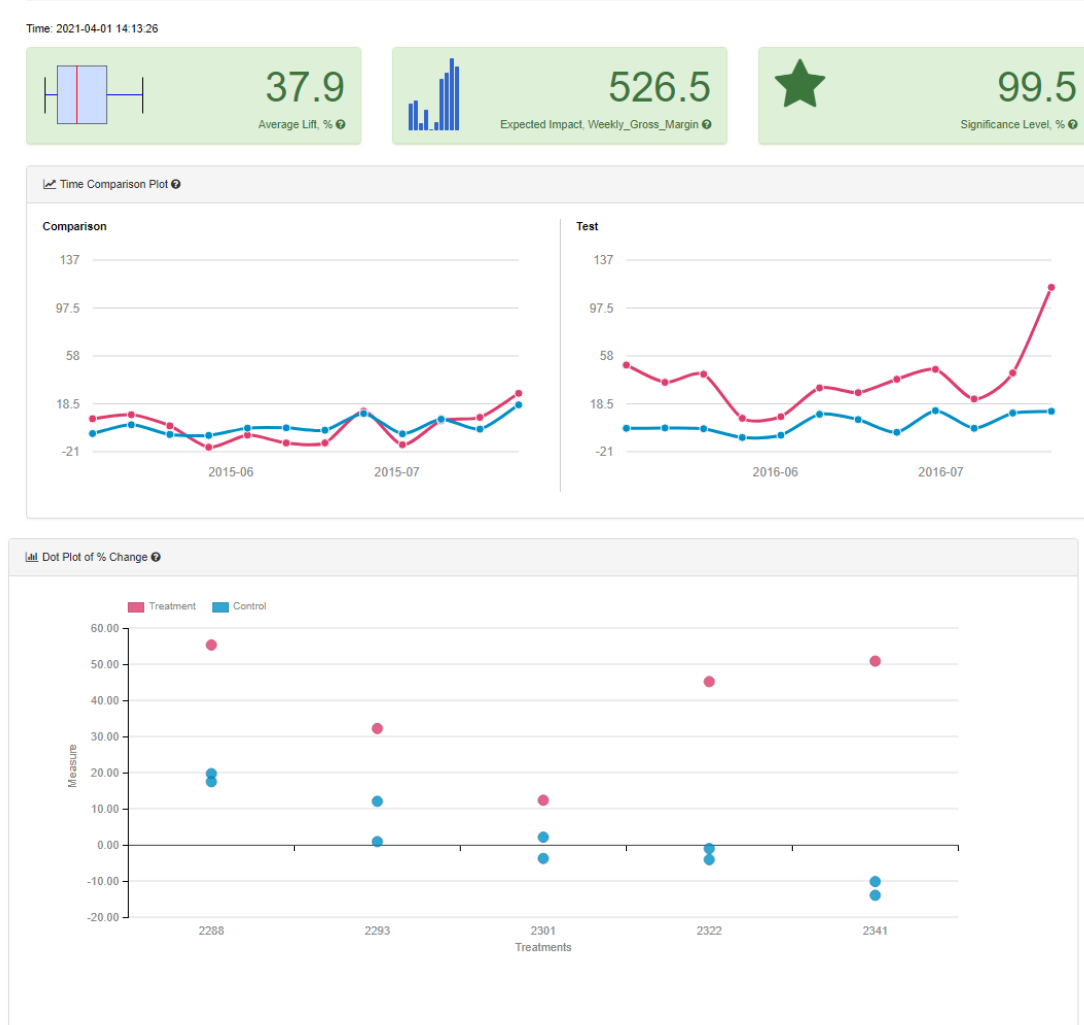
## Analysis and Conclusion

Based on the A/B Analysis, Round Roasters should roll out the new menu to all stores. The predicted profitability is greater than the 18% threshold, that is required to justify the increased marketing budget. This new marketing campaign and updated menu is a great win for the coffee chain.

### West Region Summary

The lift Average lift for the West region is 37.9% and the statistical significance is 99.5%

### AB Test Analysis for Weekly\_Gross\_Margin



### Lift Analysis for Weekly\_Gross\_Margin

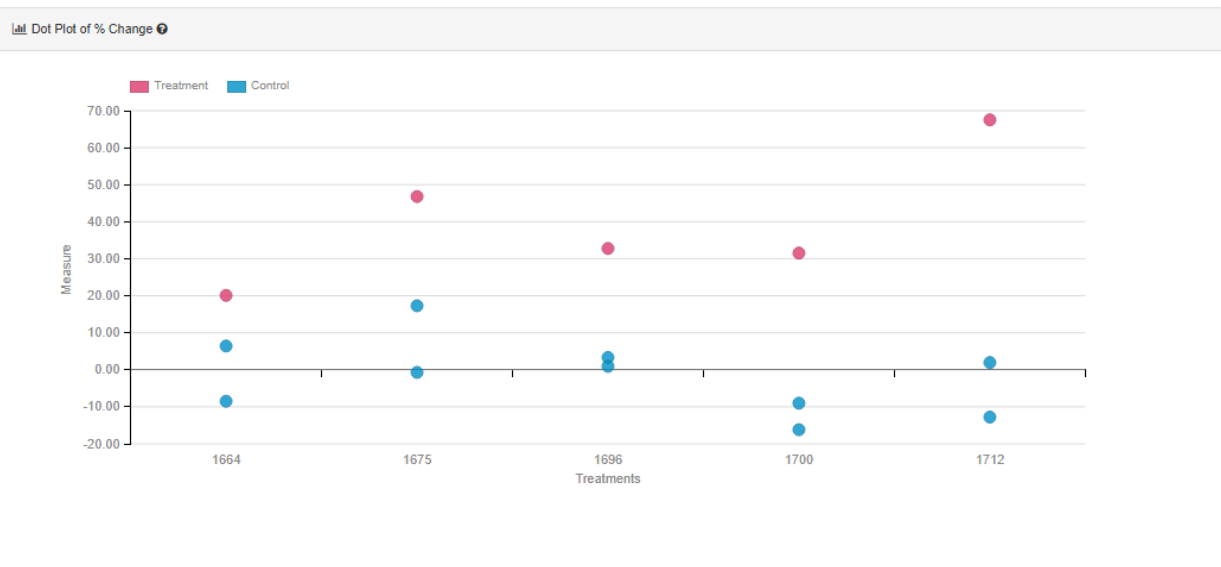
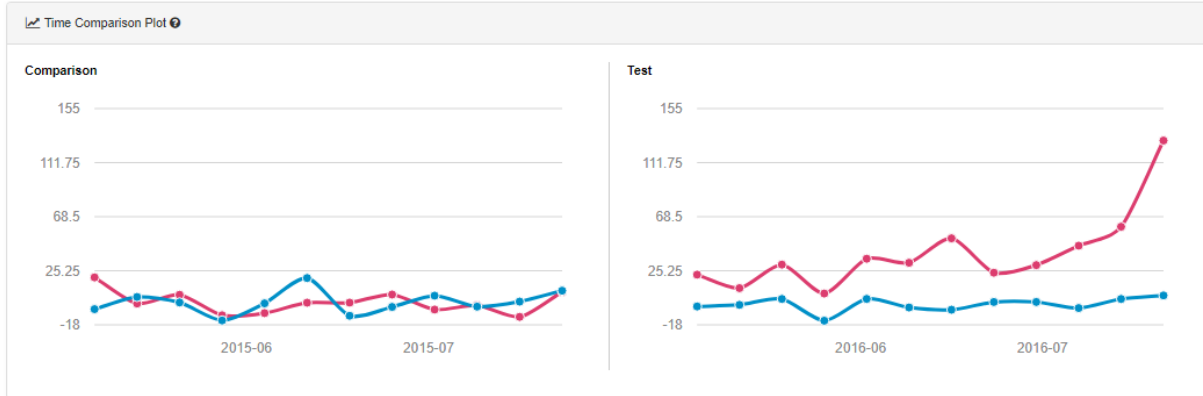
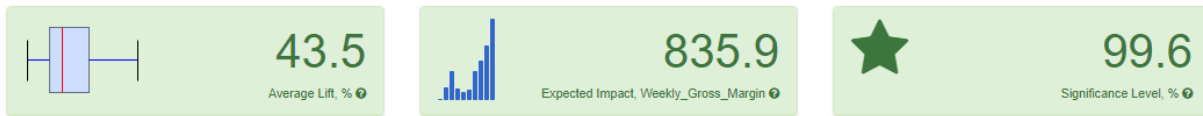
Lift	Expected Impact	Significance Level
37.9%	527	99.5%
Summary Statistics for Weekly_Gross_Margin by Test Group		
Statistic	Treatment	Control
Average	39.17	1.92
Minimum	12.34	-13.96
Maximum	55.30	19.70
Standard Deviation	16.34	11.24

## Central Region Summary

The lift Average for the Central region is 43.5% and the statistical significance is 99.6%

## AB Test Analysis for Weekly\_Gross\_Margin

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## Summary Statistics for Weekly\_Gross\_Margin by Test Group

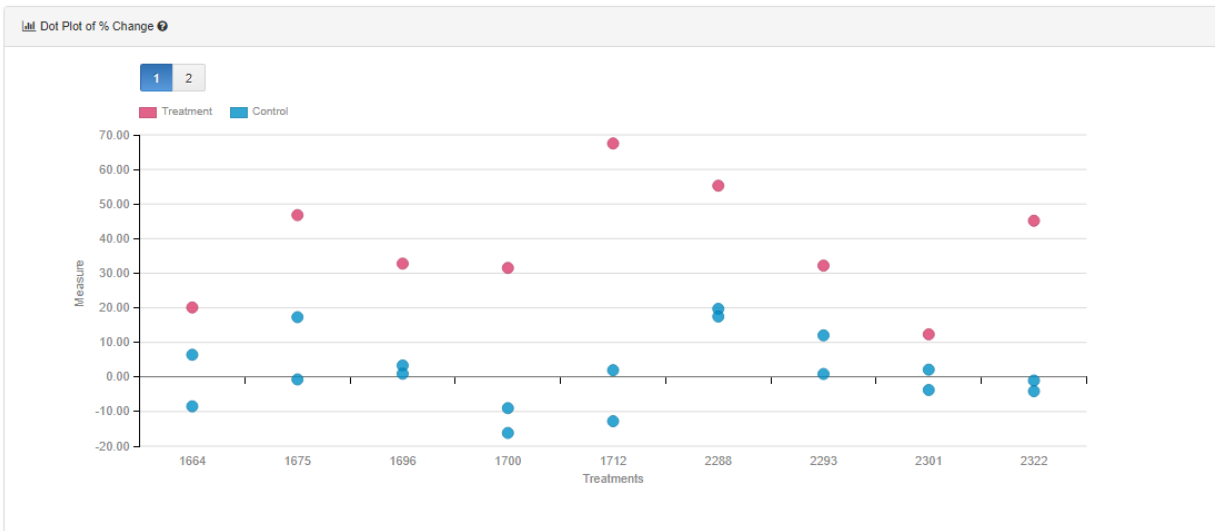
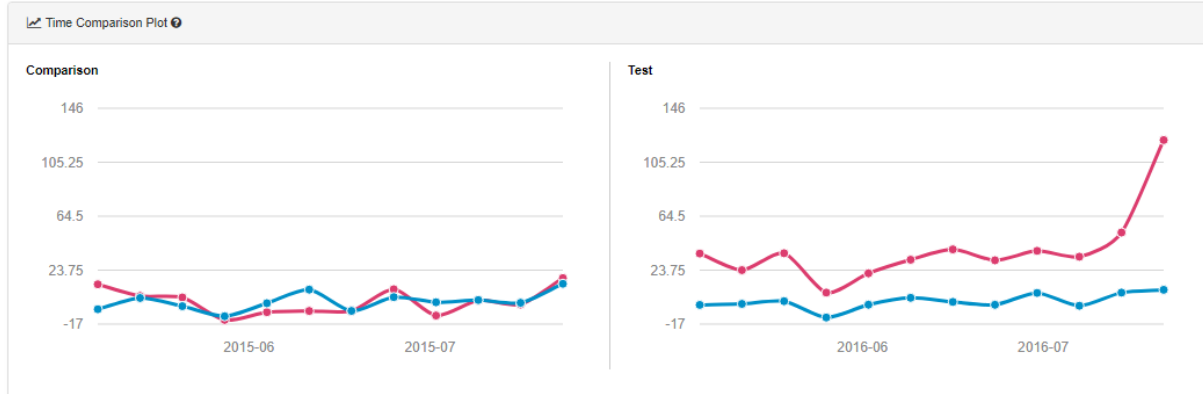
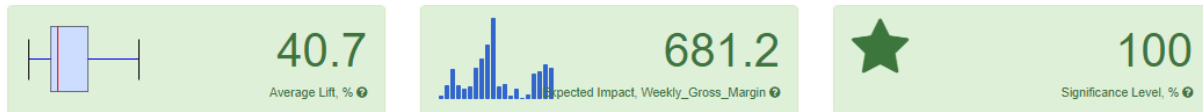
Statistic	Treatment	Control
Average	39.74	-1.73
Minimum	20.09	-16.18
Maximum	67.52	17.29
Standard Deviation	17.15	10.03

## Overall Summary

The lift Average for the Central region is 40.7% , is another indication that we should roll out the menu to all stores.

## AB Test Analysis for Weekly\_Gross\_Margin

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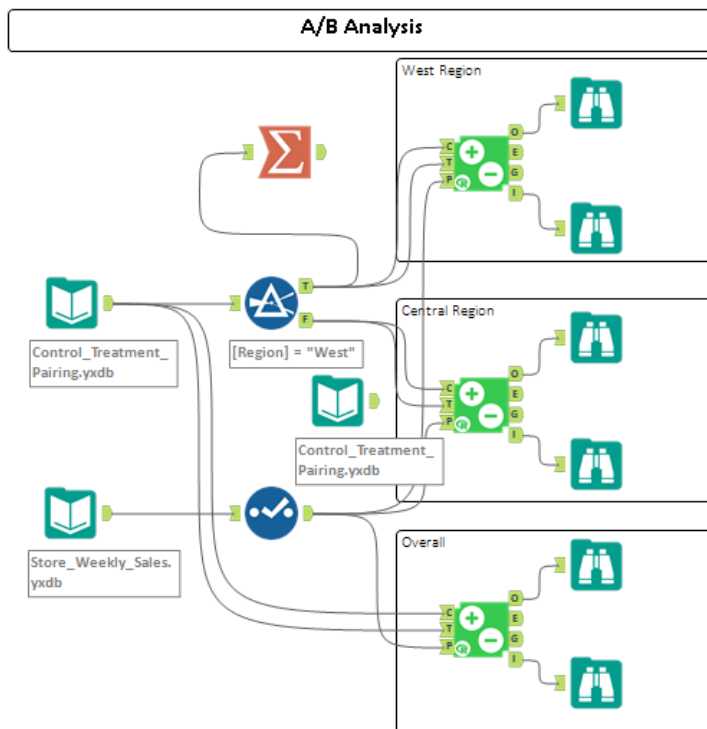
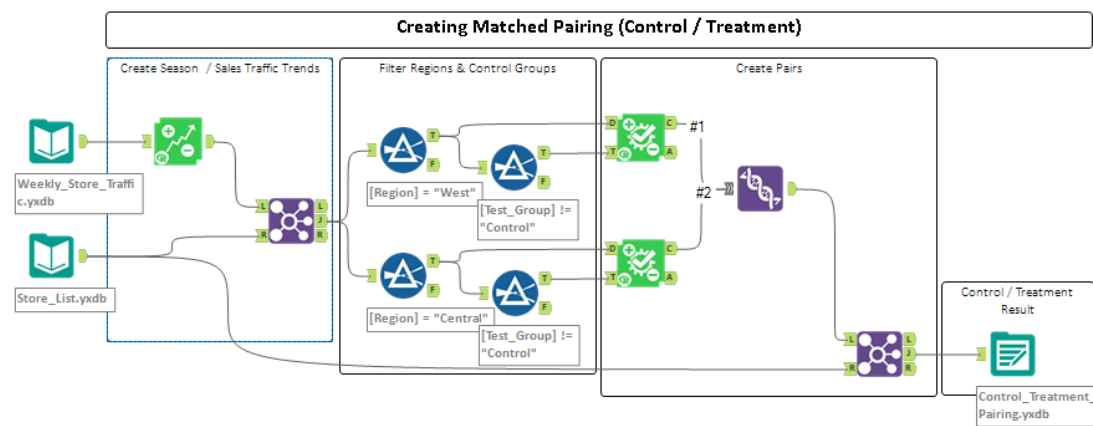
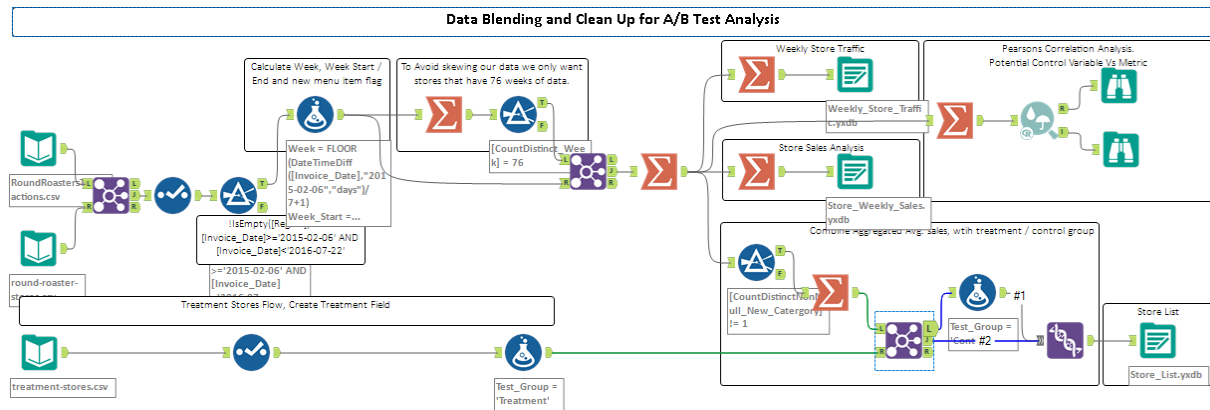


## Summary Statistics for Weekly\_Gross\_Margin by Test Group

Statistic	Treatment	Control
Average	39.45	0.09
Minimum	12.34	-16.18
Maximum	67.52	19.70
Standard Deviation	16.30	10.54



## Alteryx Workflows



## Resources

ab-test-guide.pdf provided by Udacity

Udacity Knowledge

<https://knowledge.udacity.com/questions/473379>

<https://knowledge.udacity.com/questions/49976>

<https://knowledge.udacity.com/questions/224596>