

Project: Analyzing a Market Test

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?

I would use the sum of gross margin as the performance metric to evaluate whether to introduce gourmet sandwiches and limited wine offerings at all the stores.

2. What is the test period?

12 weeks (from 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

In this step, you should prepare the data for steps 3 and 4. You should aggregate the transaction data to the appropriate level and filter on the appropriate data ranges. You can assume that there is no missing, incomplete, duplicate, or dirty data. You're ready to move on to the next step when you have weekly transaction data for all stores.

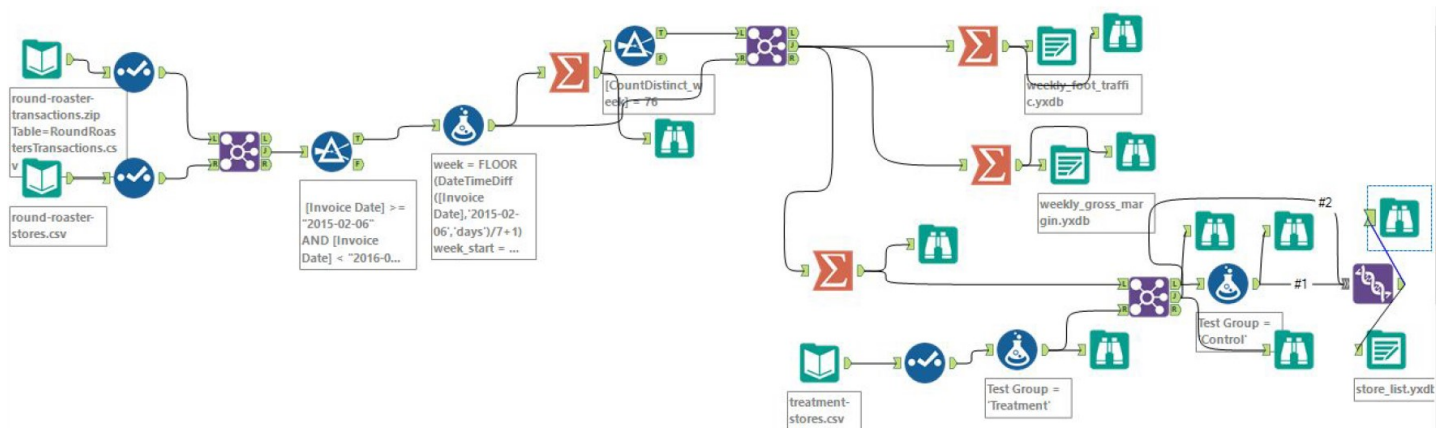
I combined RoundRoasterTransactions and Round-Roaster-Stores data.

I gathered 76 weeks data (from 6-Feb-2015 to 21-Jul-2016) for all stores.

I added the week, week_start and week_end to calculate the weekly foot traffic and weekly gross margin for each store.

I added Test Group column to classify treatment and control stores.

Then I introduced Treatment-Stores dataset to create a list of control and treatment stores.



Picture 2.1 Alteryx Workflow

Step 3: Match Treatment and Control Units

In this step, you should create the trend and seasonality variables, and use them along with you other control variable(s) to match two control units to each treatment unit. Note: Calculate the number of transactions per store per week to calculate trend and seasonality.

Apart from trend and seasonality...

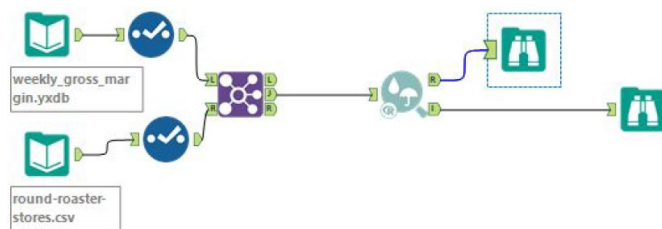
1. What control variables should be considered? Note: Only consider variables in the RoundRoastersStore file.

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?

Using Alteryx's Association Analysis tool, AvgMonthSales has high correlation with the performance metric, i.e. Sum of Gross Margin.

Sq_ft has a poor correlation with the performance metric.



Picture 3.1 Alteryx Workflow. Using Association Analysis tool.

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 | |

Picture 3.2 Alteryx's Correlation Report.

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

I would use AvgMonthSales ,Trend and Seasonality to match 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

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

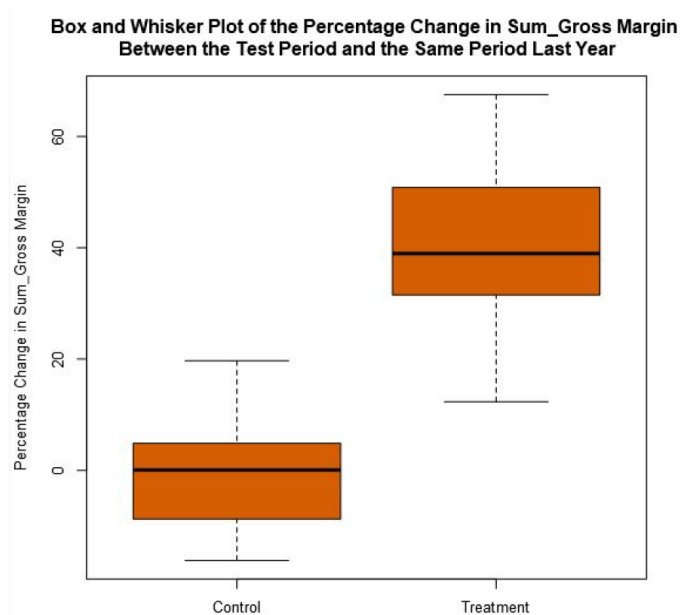
Answer these questions. Be sure to include visualizations from your analysis:

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

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 |

Picture 4.1 Alteryx's Lift Analysis Report.



Picture 4.2 Alteryx's Box and Whisker Plot.

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

The lift for West region is 37.9% whereas the lift for Central region is 43.5%.

Both lifts have a statistical significance of 99.5% and 99.6% respectively.

| 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 |

Picture 4.3 Lift Analysis Report for West 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 |

Picture 4.4 Lift Analysis Report for Central Region.

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%.

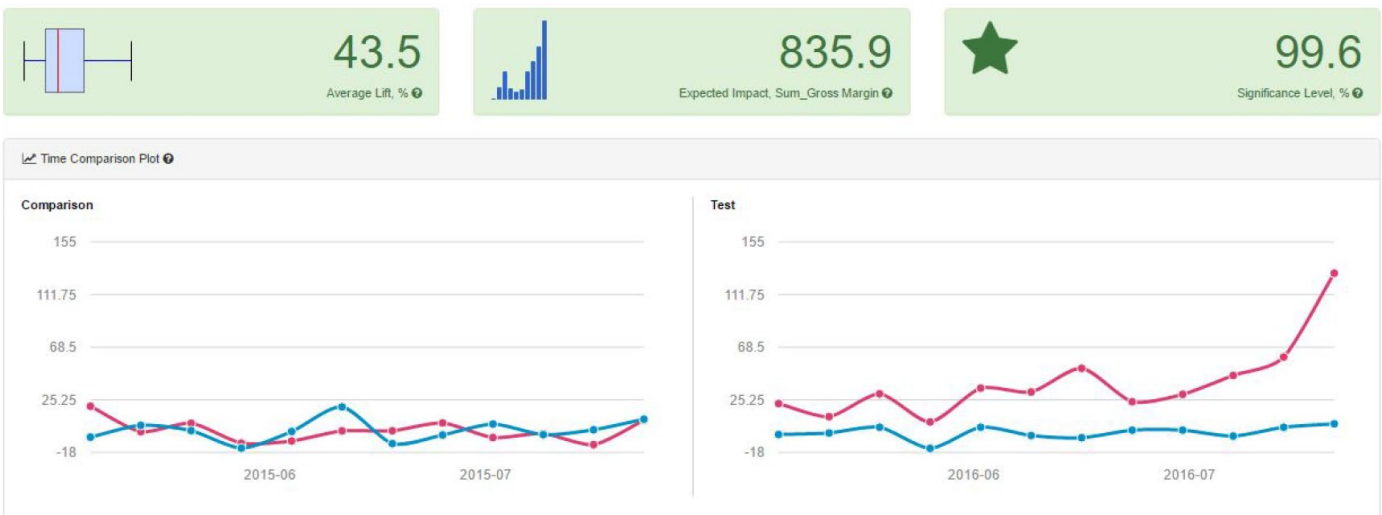
Lift Analysis for Sum_Gross Margin

| 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 |

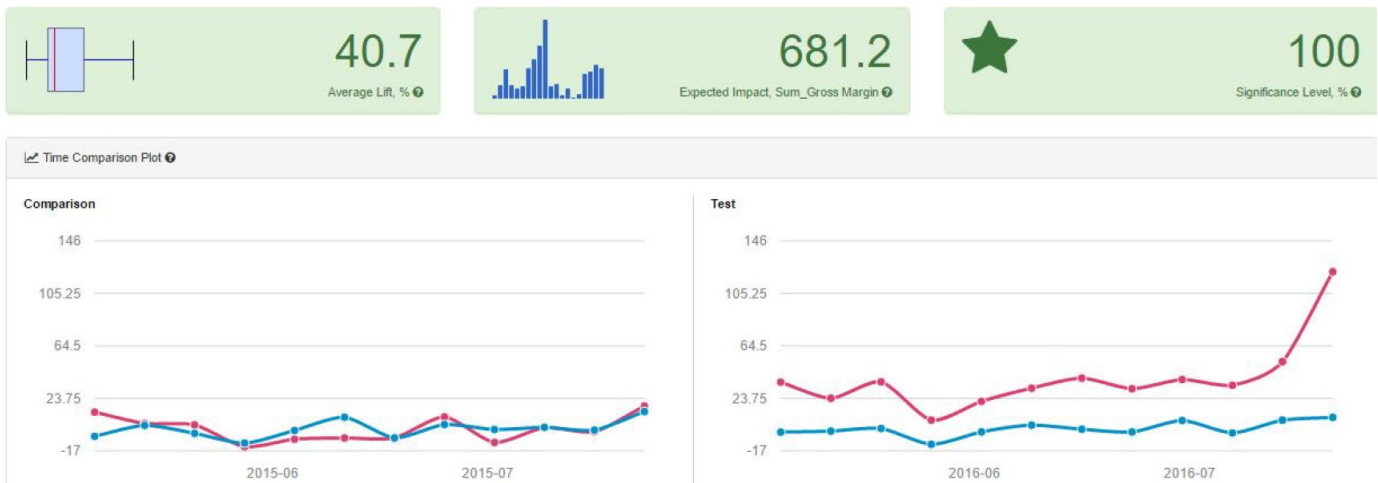
Picture 4.5 Lift Analysis Report for the new menu.



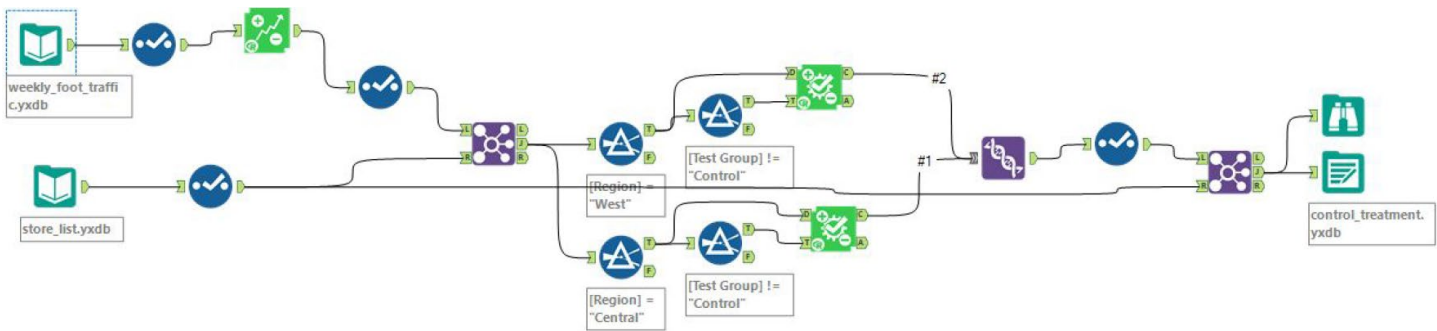
Picture 4.6 A/B Analysis for West Region.



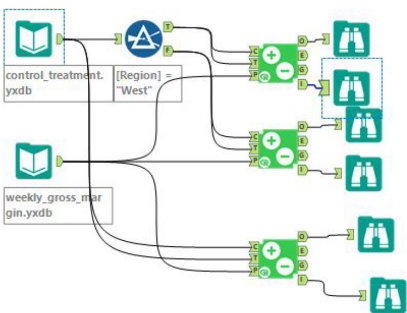
Picture 4.7 A/B Analysis for Central Region.



Picture 4.8 A/B Analysis for the new menu.



Picture 4.9 Alteryx Workflow for Treatment and Control Store Matching.



Picture 4.10 Alteryx Workflow for A/B Analysis.