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?

   The performance metric chosen for this test is the Gross Margin of the product sales. Since, the goal is to increase product sales in the stores.

2. What is the test period?

   The test period is the duration when the experiment is carried out. In this scenario, there is a 10 week test period from 29th April 2016 to 21st July 2016

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

   The data should be aggregated at a weekly level. Doing this also ensures the AB control tool in Alteryx is executed in a synchronized manner.

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.

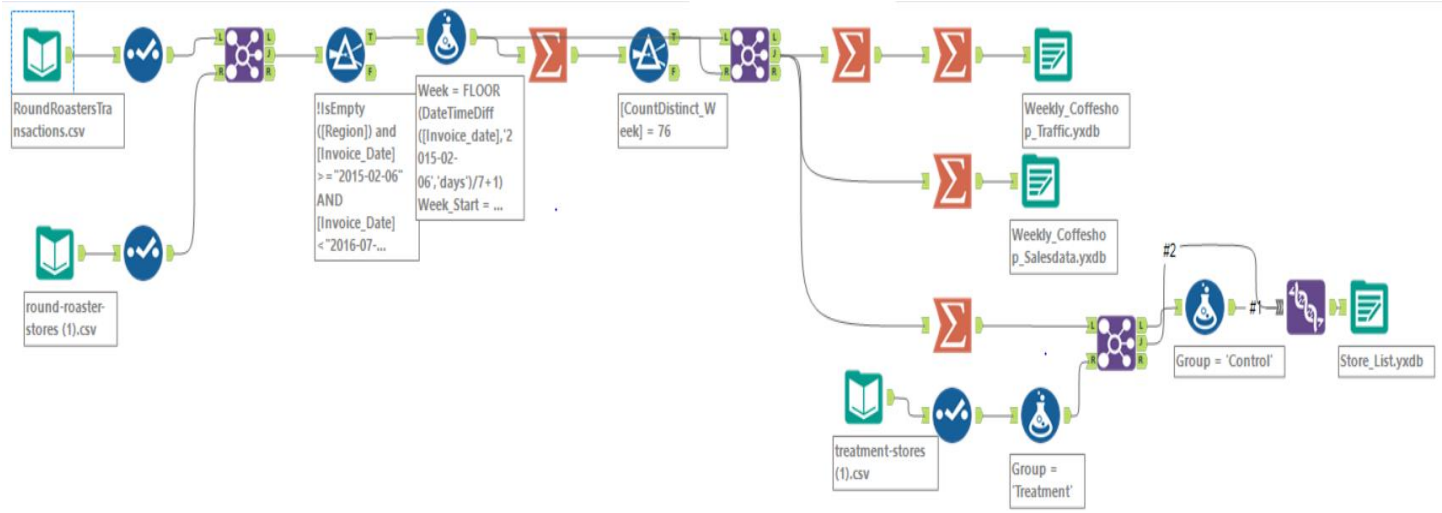
Using the three files given,

- 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.

We aggregate the data to a weekly level and set experiment dates. Furthermore, we include stores that have 76 weeks of data (We are asked to use 12 weeks to calculate trend, so we'll need 64 weeks of data prior to the test start date. Since the test lasts for 12 weeks, this means a total of 76 weeks of data will be needed).

Finally, we aggregate date into three files to be used in the AB trend and Control tools,

- Weekly store traffic data for A/B Trend Tool -> Produces our seasonality and trend 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 Trend Tool
- Sales data for A/B Analysis tool -> Produces the final results



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.

   The control variables to be considered are **Sqft** and **Average Monthly Sales**. The other variables do not appear to show a relationship to the target variable.

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

   As we can see in the correlation matrix, Sqft has a low correlation (-0.2) with the target variable i.e Gross Margin . While AvgMonthlySales has a high correlation(0.99). Also, there appears to be no correlation between the control variables(-0.04).

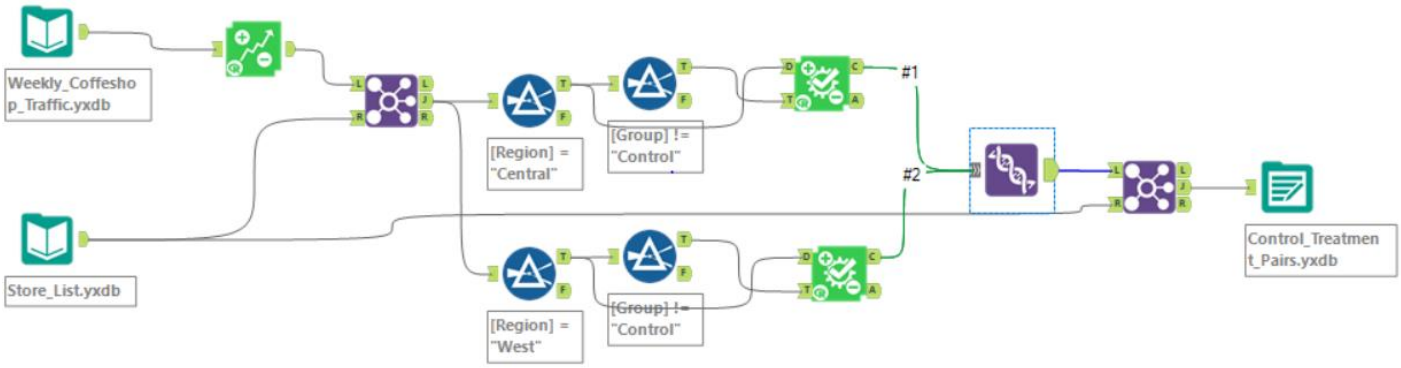
Record	FieldName	Sq_Ft	AvgMonthSales	Sum_Sum_Gross_Margin
1	Sq_Ft	1	-0.046967	-0.024255
2	AvgMonthSales	-0.046967	1	0.990982
3	Sum_Sum_Gross_Margin	-0.024255	0.990982	1

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

   Therefore, for this model we will be using **AvgMonthSales** as a control variable along with trend and seasonality.

4. Please fill out the table below with your treatment and control stores pairs:

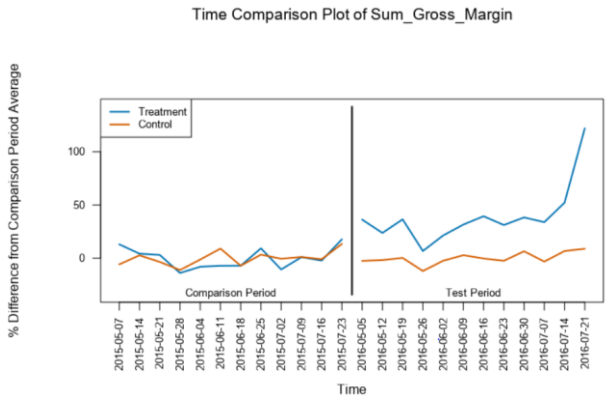
Treatment Store	Control Store 1	Control Store 2
1664	7162	8112
1675	1580	1807
1696	1964	1863
1700	2014	1630
1712	8162	7434
2288	2568	9081
2293	12219	9524
2301	3102	9238
2322	2409	3235
2341	12536	2383



Step 4: Analysis and Writeup

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

   Yes, the company should roll out the updated menu to all stores.



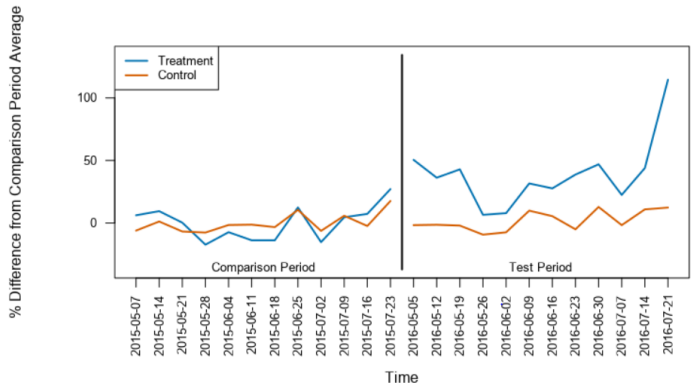
   The above graph shows the measure of the performance of interest i.e gross margin, if the menu was launched in overall region. We can see that during the comparison period(previous year) the gross margin for both the treatment and control group were the same. But during the test period, the gross margins for treatment units have a significant difference in the gross margin for control units. Hence, a new menu launch can indicate an increase in gross margin per store per week.

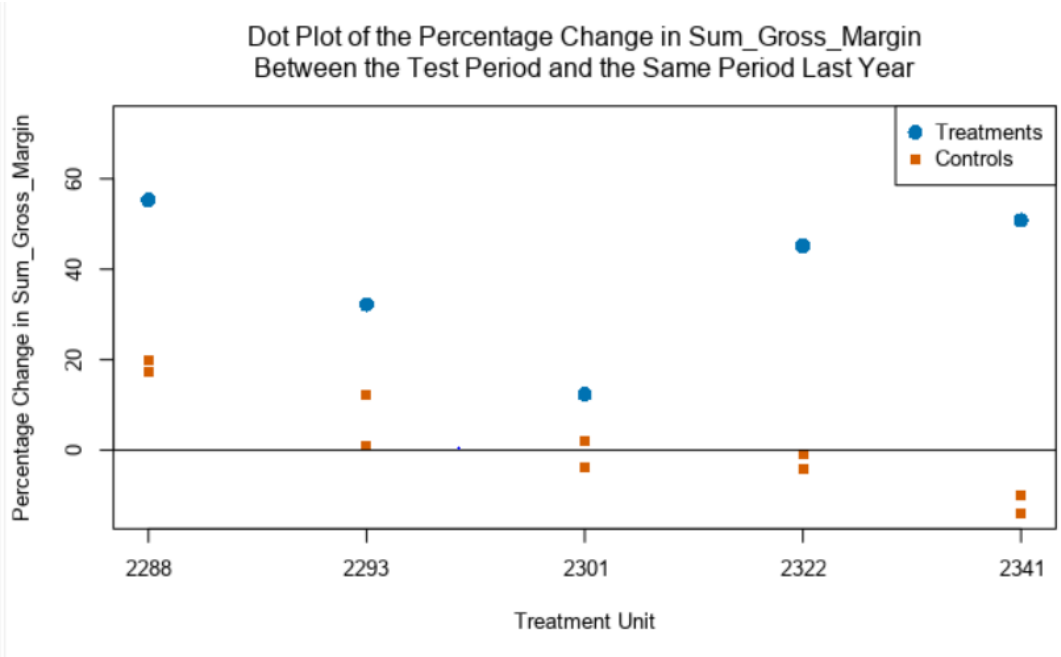
2. What is the lift from the new menu for West and Central regions (include statistical significance)?

West –
The report shows us that the test menu, showed 37.9% improvement at a significance of 99.5% over the control menu. This means introducing the new menu will increase average lift by **37.9%** (increase gross margin) and the gross margin for each store will increase by **$527** per store per week.

Launching a new menu will increase gross margin. Hence, the new menu should be launched across all stores in west. The graph supports our result.

Time Comparison Plot of Sum_Gross_Margin

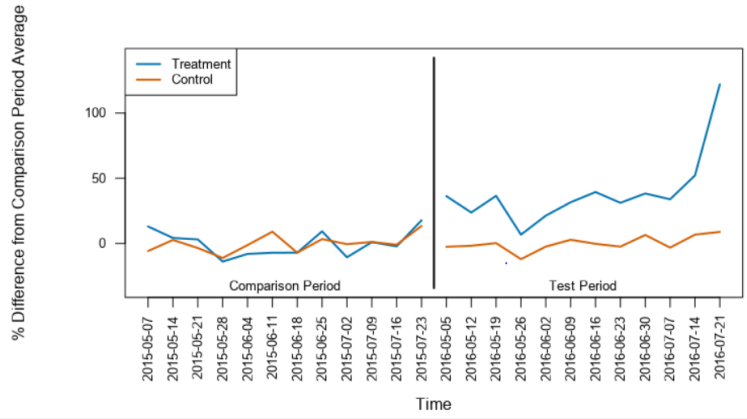


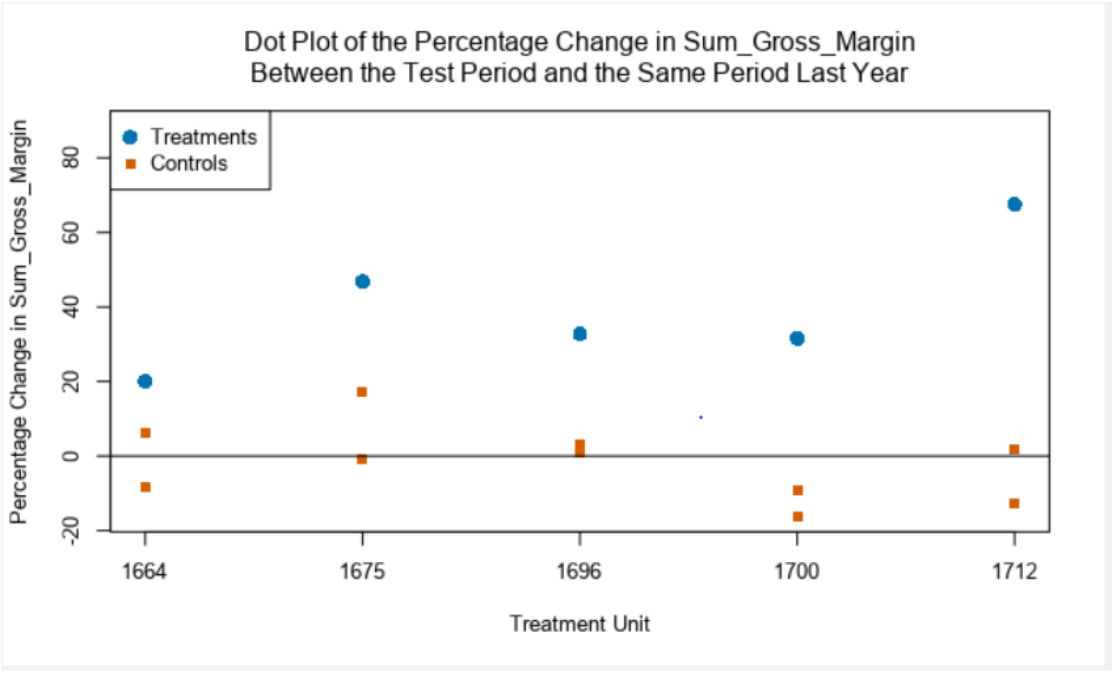


Central –
The report shows us that the test menu, showed 43.5% improvement at a significance of 99.6% over the control menu. This means introducing the new menu will increase average lift by **43.5%** (increase gross margin) and the gross margin for each store will increase by **$835.9** per store per week.

Launching a new menu will increase gross margin. Hence, the new menu should be launched across all stores in central. The graph supports our result.

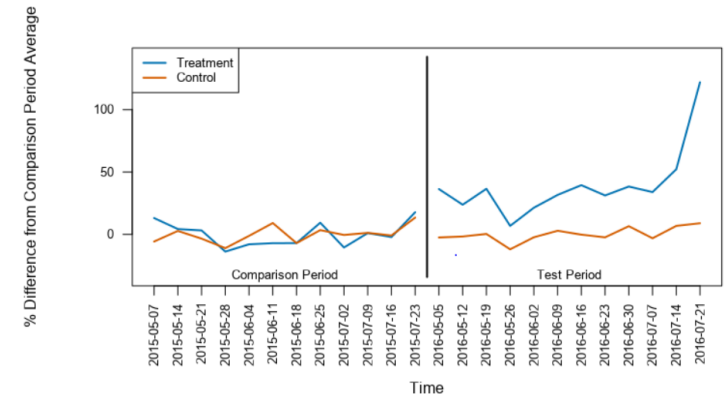
Time Comparison Plot of Sum_Gross_Margin

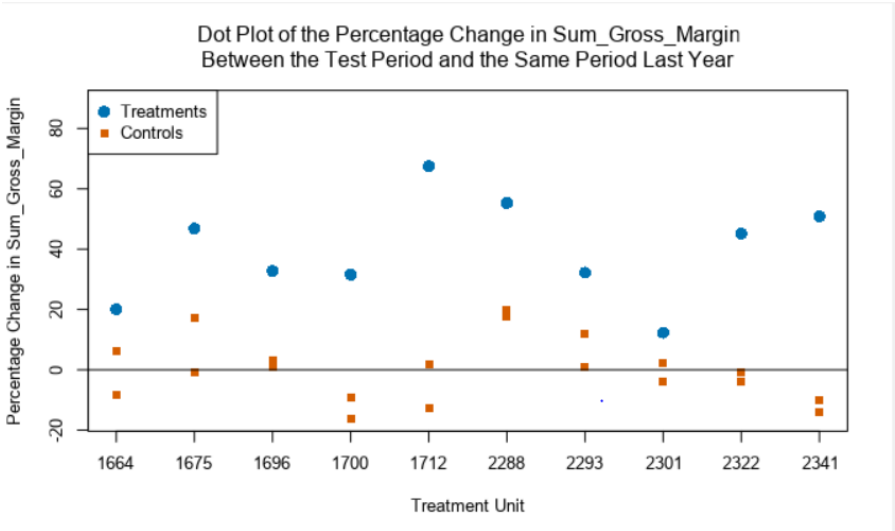


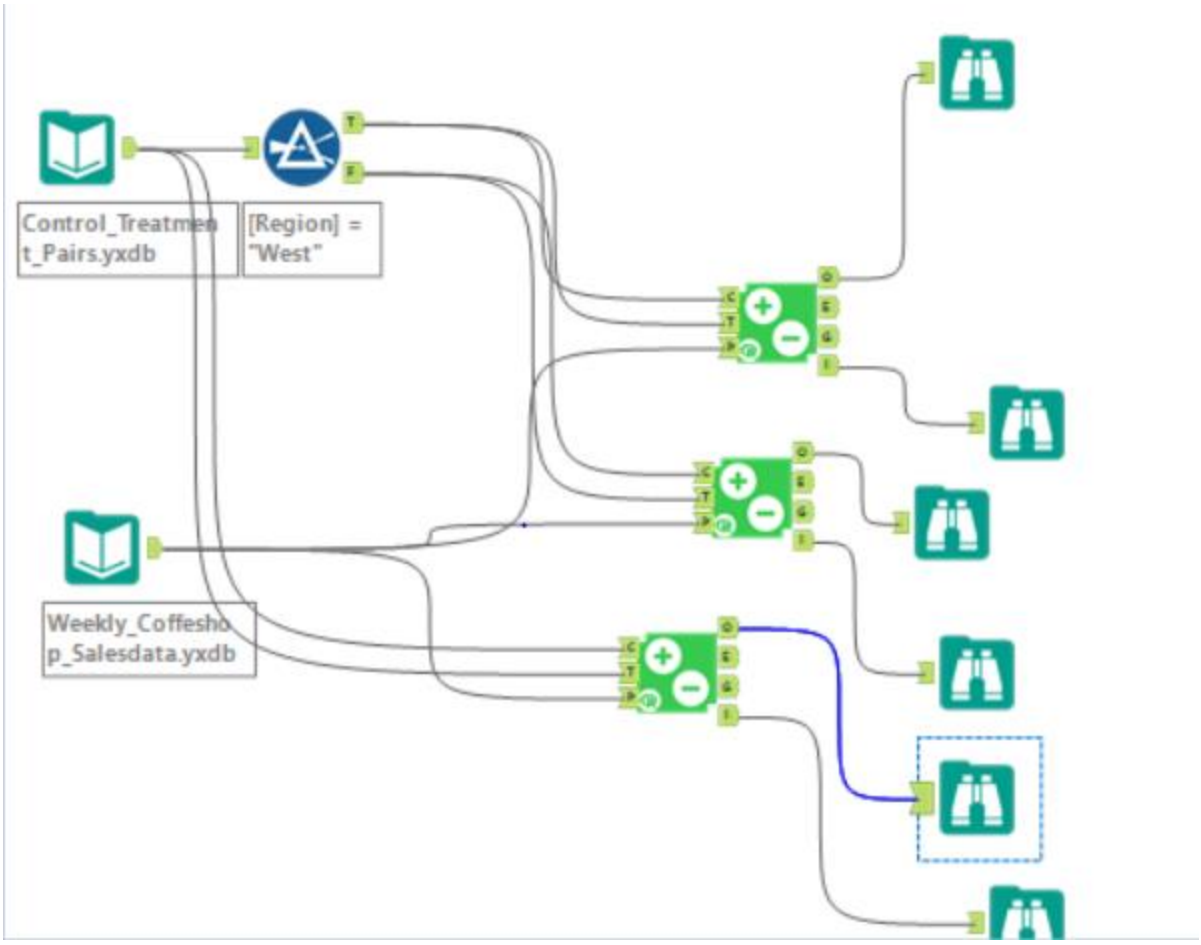


3. What is the lift from the new menu overall?
   The report shows the AB analysis for stores in overall regions.
   This means introducing the new menu will increase average lift by **40.7%** (increase gross margin) and the gross margin for each store will increase by **$681.2** per store per week. Also, the results are 100% statistically significant. This indicates a gain in gross margin when product is launched.

Time Comparison Plot of Sum_Gross_Margin






Control_Treatment_Pairs.yxdb
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Weekly_Coffeshop_Salesdata.yxdb