

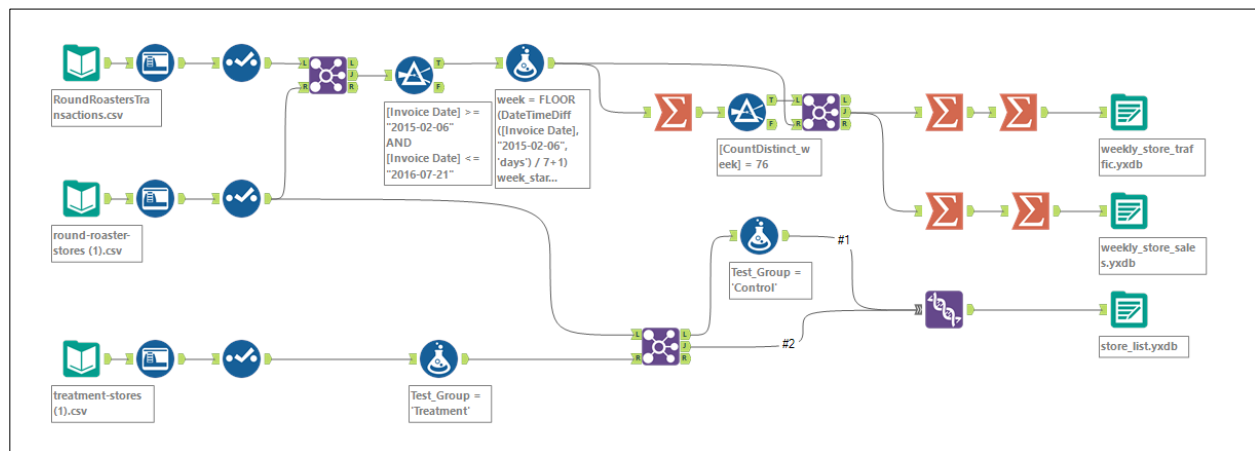
Project: Analyzing a Market Test

Step 1: Plan Your Analysis

1. We use the profit represented as the *gross_margin* as the performance metric to evaluate the results of our test, in which we are looking to achieve at least 18% increase in profit growth compared to the comparative period while compared to the control stores.
2. The test period is from 2016-April-29 to 2016-July-21.
3. The data be aggregated to the weekly level.

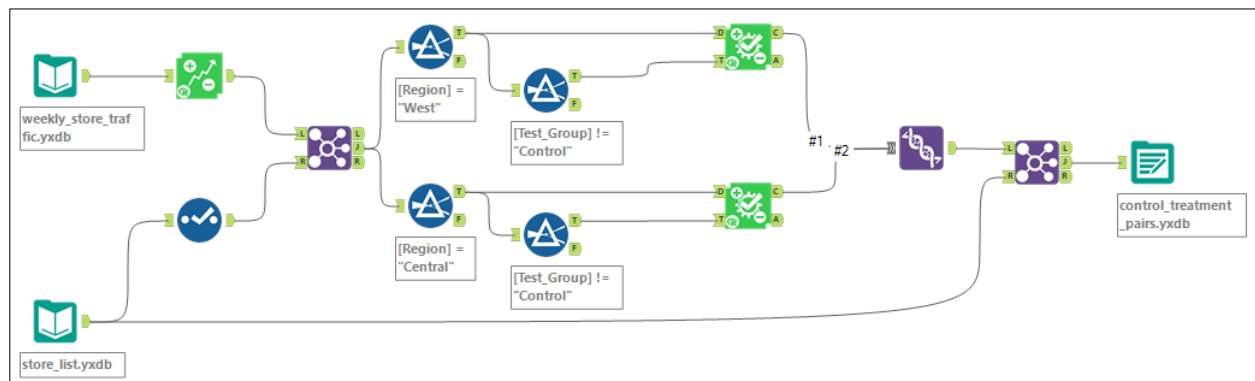
Step 2: Clean Up Your Data

The data preparation workflow is as follows. We first join the *RoundRoastersTransactions.csv* file and *round-roaster-store.csv* and filter the data to calculate the weekly numbers and therefore aggregate the data to the weekly level. We also create a store list by joining the *round-roaster-store.csv* and *treatment-store.csv* files and label the treatment and control stores.



Step 3: Match Treatment and Control Units

Creating the trend and seasonality variables and matching using them along with the other control variable(s) to match two control units to each treatment unit.



- The following control variables should be considered:
 - AvgMonthSales
 - Sq_Ft
- The p-value of 0.05 suggests that there is strong correlation between Gross Margin and both Sq_Ft and AvgMonthSales respectively. The Pearson Correlation Analysis results are shown below.

Pearson Correlation Analysis

Focused Analysis on Field Gross.Margin

	Association Measure	p-value	
Sq_Ft	0.0177202	0.0000000	***
AvgMonthSales	0.0049854	0.0046128	**

Full Correlation Matrix

	Gross.Margin	Sq_Ft	AvgMonthSales
Gross.Margin	1.0000000	0.0177202	0.0049854
Sq_Ft	0.0177202	1.0000000	0.2921764
AvgMonthSales	0.0049854	0.2921764	1.0000000

Matrix of Corresponding p-values

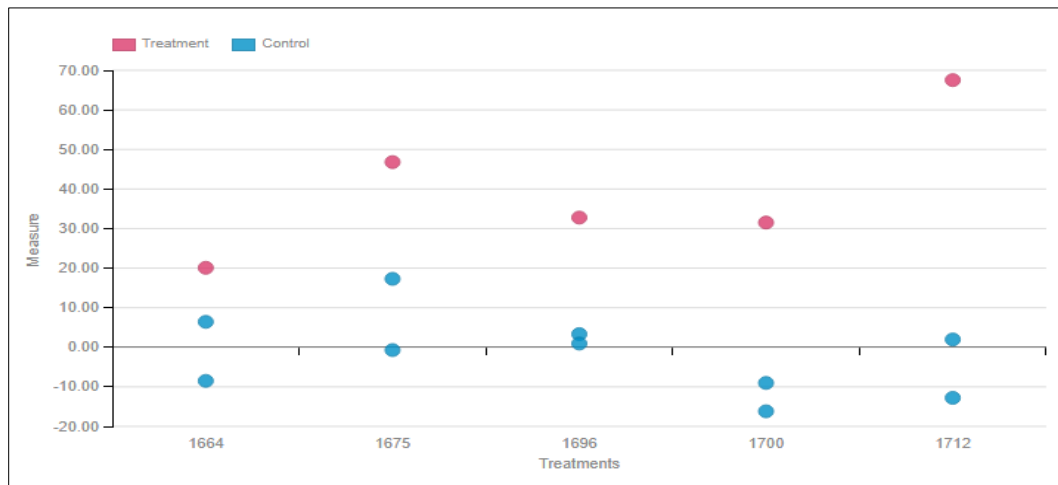
	Gross.Margin	Sq_Ft	AvgMonthSales
Gross.Margin		0.0000000	0.0046128
Sq_Ft	0.0000000		0.0000000
AvgMonthSales	0.0046128	0.0000000	

- Trend, Seasonality and AvgMonthSales control variables and used to match treatment and control stores.
- Please fill out the table below with your treatment and control stores pairs:

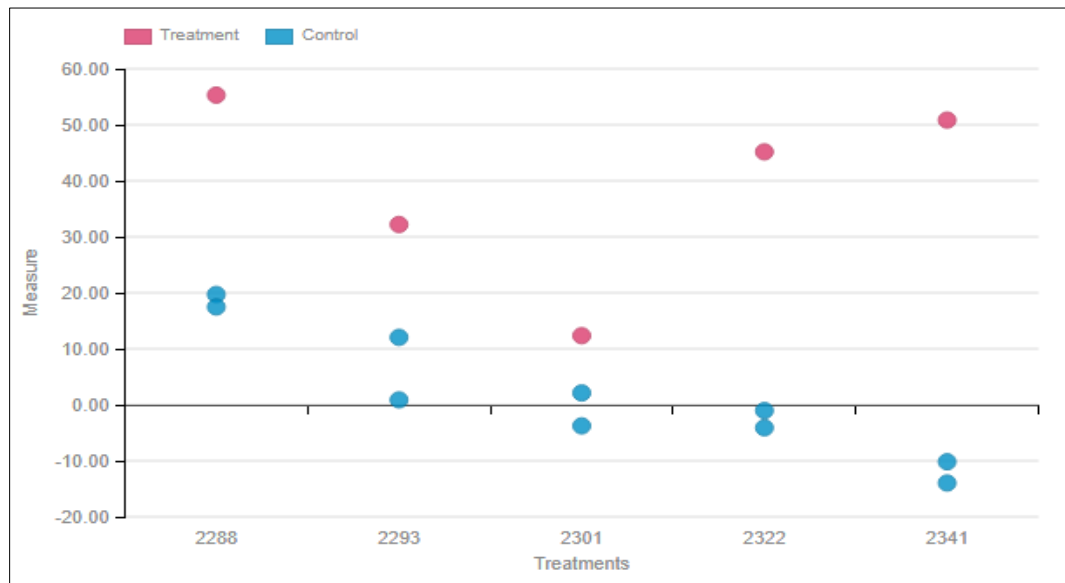
Treatment Store	Control Store 1	Control Store 2
1664	7162	8112
1675	1580	1807
1696	1964	1863
1700	2014	1630
1712	8162	7434
2288	9081	2568
2293	12219	9524
2301	3102	9238
2322	2409	3235
2341	12536	2383

Step 4: Analysis and Write-up

1. The average percentage change in the Gross Margin was 39.7% (Central Region) and 39.2% (West Region) for the treatment units in the test period relative to the comparison period. Since the change is greater than 18%, I therefore recommend that the company roll out the updated menu to all stores. The results are supported by the Dot Plots of % change shown next where we observe that the treatment store have a higher percentage change in comparison to the control stores.



Dot Plot of % Change for the Central Region



Dot Plot of % Change for the West Region

2. The lift from the new menu for West and Central regions (including statistical significance) is as follows:

	Average Lift	Significance Level
Central	43.5%	99.6%
West	37.9%	99.5%

3. As depicted below, the lift from the new menu overall is 40.7% with 100% significance level.

