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?

Round Roasters, a coffee restaurant in the United States of America. The company needs to implement a growth initiative, given that in the past few years the growth levels off and sales become stagnant. The growth initiative is to introduce gourmet sandwiches to the menu, along with limited wine offerings. It is crucial to drive people into the stores with these new offerings through television advertising campaign. The television campaign will require a significant boost in the company's marketing budget, but the profitability is unknown. It is necessary needs to figure whether the new menu can drive enough sales to offset the cost of marketing the new menu. To predicted impact to profitability, we implement A/B testing. In particular, we apply the changes in two markets that their performance would be a good proxy to predict how well the updated menu performs.
The Gross margin helps a company assess the profitability of characteristics activities. Then, this measure is used as the performance metric of the test.

2. What is the test period?

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. The file "treatment-stores" contains store information for this store.

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

The file "RoundRoastersTransactions" contains transaction level information for all of Round Roaster's stores from 2015-January-21 to 2016-August-18, they are 574 days. The test should run for a normal cycle, we need to understand and track customer flow through the store. It is assumed that customer visits the stores at least once a week, then we aggregate the data to week level.

Step 2: Clean Up Your Data

We combine "RoundRoastersTransactions" file and "round-roaster-stores" file that contains store information for each Round Roaster store in the USA. We manipulate the data in particular with Date/Time Functions that present in the Alteryx and we obtain weekly traffic and sales for each store. Furthermore, we utilize also the "treatment-stores" file to create the list of control and treatment stores.

Step 3: Match Treatment and Control Units

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

In the "round-roaster-stores" file, we have 20 variables. Between the variables present in the file, only the "AvgMonthSales" variable and "Sq_Ft" variable can be possible control variables.

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

Below, we report correlation matrix:

	AvgMonthSales	Sq_Ft	Sum_Sum_Gross.Margin
AvgMonthSales	1.000000	-0.046967	0.990982
Sq_Ft	-0.046967	1.000000	-0.024255
Sum_Sum_Gross.Margin	0.990982	-0.024255	1.000000

The “AvgMonthSales” variable is highly correlated with the performance metric. Indeed, the “Sq_Ft” variable has a low correlation. Then, only the “AvgMonthSales” variable is used as control variable.

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

The AB Trend Tool in Alteryx allows creating of trend and seasonality variables to use as control variables. These variables are the other control variables in addition to 'AvgMonthSales” variable.

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

Treatment Store	Control Store 1	Control Store 2
1664	7162	8122
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

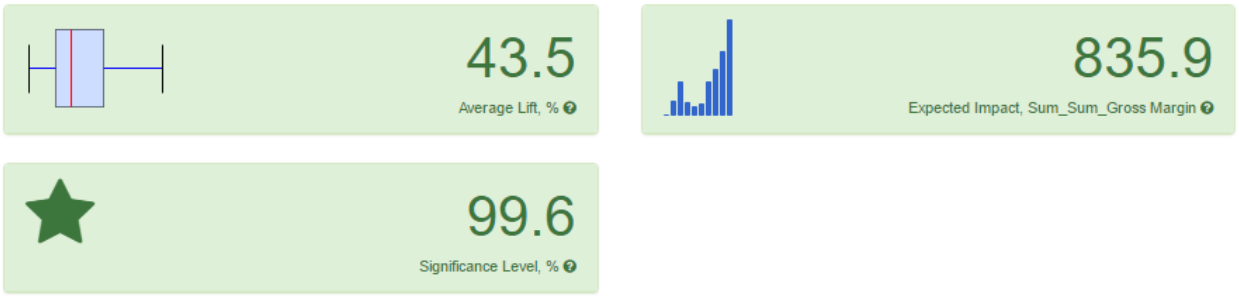
Step 4: Analysis and Writeup

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

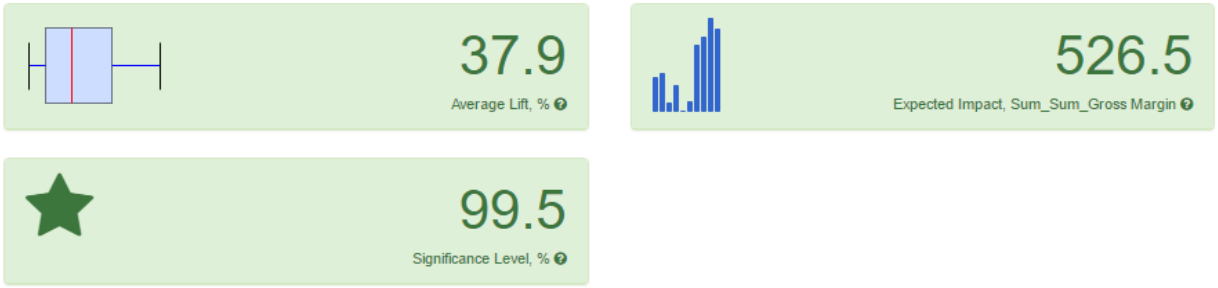
The company should roll out the updated menu to all stores given that the predicted impact to profitability is enough to justify the increased marketing budget. In fact, the increase in profit growth is greater than the established threshold from the management of 18 %.

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

Below, the results of the experiment where it tests implementation of growth strategy. If we consider the store in the central regions:



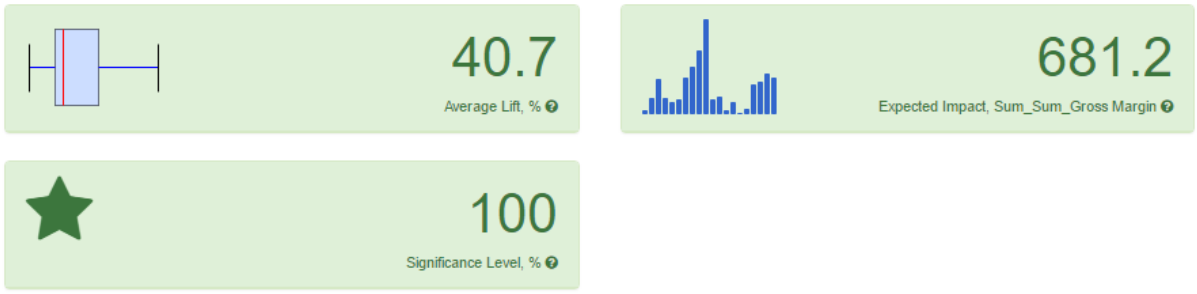
A comparison of the treatment-control pairs shows an average lift in gross margin for the treatment units over the control units of 43.5 %. The probability that the difference in the means of the performance between and control group is significantly different from zero. Indeed, if we consider the store in the west regions:



A comparison of the treatment-control pairs shows an average lift in gross margin for the treatment units over the control units of 37.9 %. The probability that the difference in the means of the performance between and control group is significantly different from zero

3. What is the lift from the new menu overall?

If we consider all stores of Round Roasters, the results of the experiment that test implementation the growth strategy are:



A comparison of the treatment-control pairs shows an average lift in gross margin for the treatment units over the control units of 40.7 %. The probability that the difference in the means

of the performance between and control group is significantly different from zero.