Project: Analyzing a Market Test

Step 1: Plan Your Analysis

Before starting data preparation period, we need to clarify our performance metric, unit of experiment, time period etc.

First, the aim of this project is to find out whether making changes in menu and doing the relevant advertising will increase the profit level enough to worth it. So, we need to compare the profit level, which in our dataset is gross margin, between treatment and control stores, and as a metric we will use average groos margin per week per store. Our test unit is a store, as we will make experiment in each store and will compare the results between treatment and control stores.

We will do the test for 12 weeks, our test period is from 2016-April-29 to 2016-July-21. We will choose a week as a time unit and will aggregate data on a weekly basis. The lower the time unit the more accurate results we will have in our analysis. However, there is no need to aggregate on a daily basis because we have different number of transaction each day taking into account the specifics of each day of the week (for example on weekend we may have better traffic and more transactions).

Step 2: Clean Up Your Data

For this analysis we will create three datasets: 'weekly transactions' which gives information about each store and weekly transaction in that store including week_start and week_end information, 'store list' which includes store ID, region, as well as information whether a store is in test (1) or control (0) group, and finally 'data analysis' – a data which we will use for Alteryx A/B analysis tool, including information about average monthly sales and gross margin per store per week.

Step 3: Match Treatment and Control Units

First, we will use A/B Trent tool in Alteryx and will create trend and seasonality variables using weekly transactions per store variable we've already created in 'weekly transactions' file.

In order to find out another control variable except trend and seasonality we will run correlation between our target variable (gross margin per week) and other possible numeric variables from 'round-roaster-stores' file.

	Sum_Gross Margi	*Sq_Ft*	*AvgMonthSales*
Sum_Gross	1		
Sq_Ft	-0.01871331	1	
AvgMonth	0.788959034	-0.04696736	1

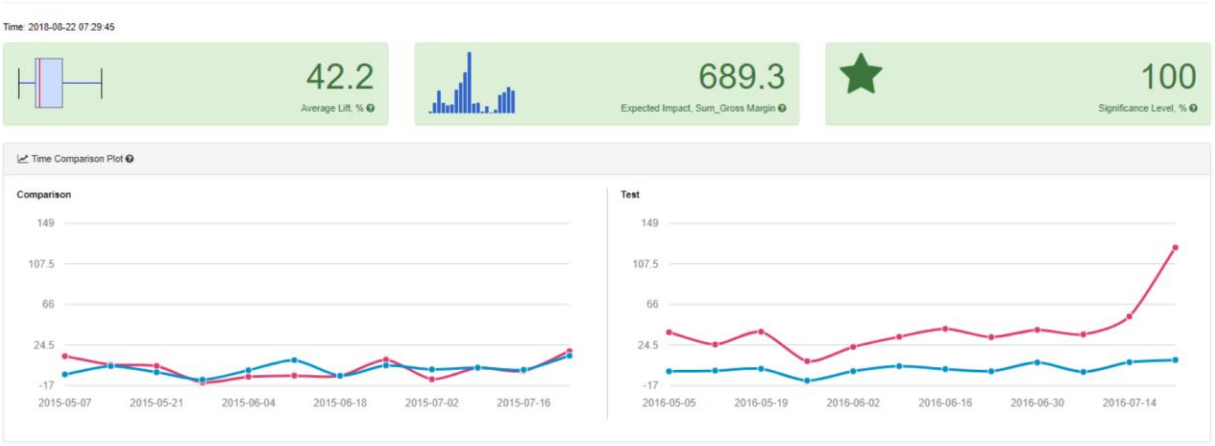
As we can see from the correlation matrix, there is a positive correlation between gross margin and average month sales. So, as another control variable we will use 'Average Month Sales'.

Here are the pairs of treatment and control stores:

Treatment Store	Control Store 1	Control Store 2
1664	7162	8112
1675	1580	1807
1696	1964	1863
1700	2014	1630
1712	8162	7434
2282	9081	2568
2293	12219	9524
2301	3102	9238
2322	2409	3235
2341	12536	2383

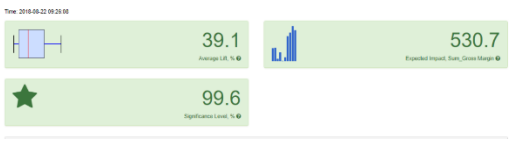
Step 4: Analysis and Writeup

After using Alteryx Analysis tool, we are able to understand the impact of trying new menu and the TV advertisement and whether there is a sense to implement the changes in all the stores. As we have given instructions, we should have at least 18% increase in gross profit to be satisfying.



As we can see, we have 42.2% lift in weekly gross profit per store which is much higher than there was necessary, with 100% level of significance. If we implement the new menu, we will have on average $689.3 increase in weekly gross profit per store. In the visualization it is obvious how treatment group stores showed increase in gross profit in test period compared to 2015-year same period.

Below is the information regarding each region (left – west region, right – central region):

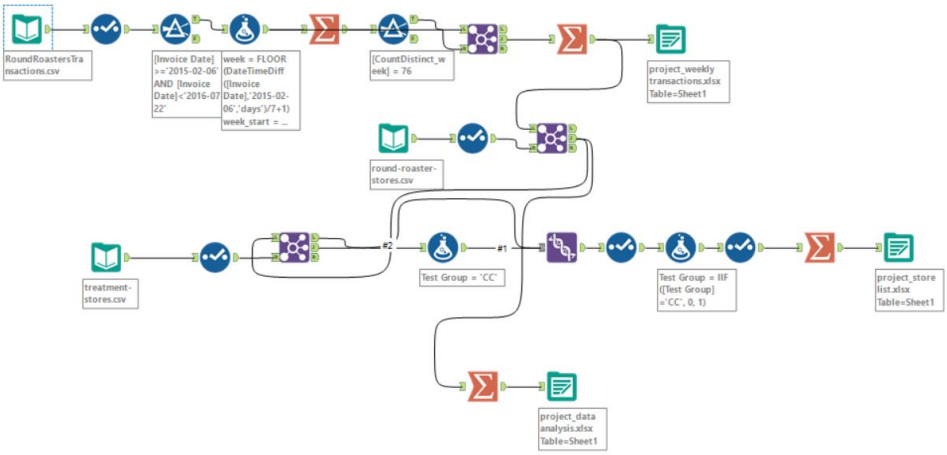


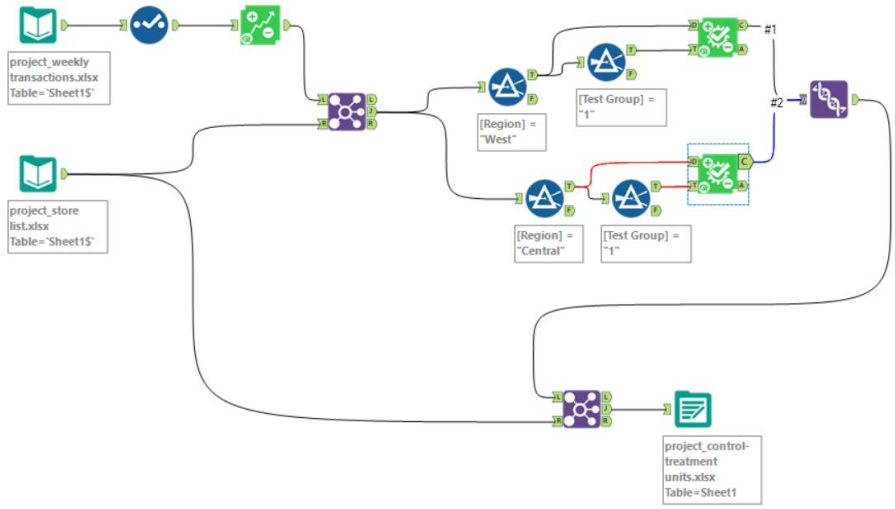
As we can see, in both regions we have 99.6% level of significance, which is quite high, and both region had more than 18% lift in gross profit which is more than satisfying to implement new menu. However, as we notice, the treatment stores of central region had a higher lift

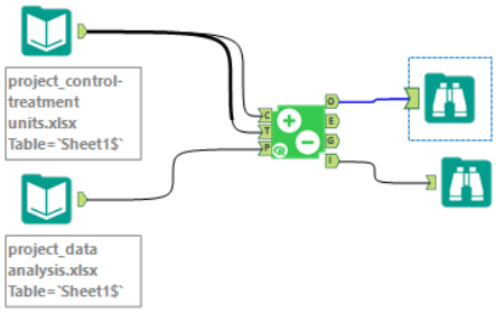
percentage (45.2%) and higher lift amount ($847.9) compared to west region (39.1%, $530.7) which means that if we implement the new menu in the control stores of central region our benefit (weekly gross profit) will be higher.

Thus, our final recommendation is to implement the new menu and TV advertisement in all stores.

Below are the Alteryx workflows used in this project:






project_control-
treatment
units.xlsx
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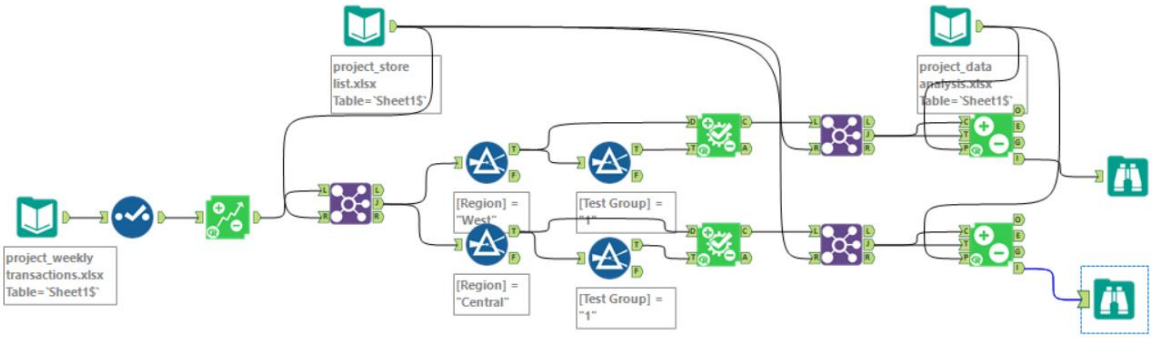
project_data
analysis.xlsx
Table=`Sheet1$`


project_store
list.xlsx
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project_data
analysis.xlsx
Table=`Sheet1$`
project_weekly
transactions.xlsx
Table=`Sheet1$`
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"West"
[Region] =
"Central"
[Test Group] =
"1"
[Test Group] =
"1"