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 company wants to know whether the impact of profitability will be high to justify increasing marketing budget for new menu additions. Since profitability is a concern, it would make sense to use total gross margin
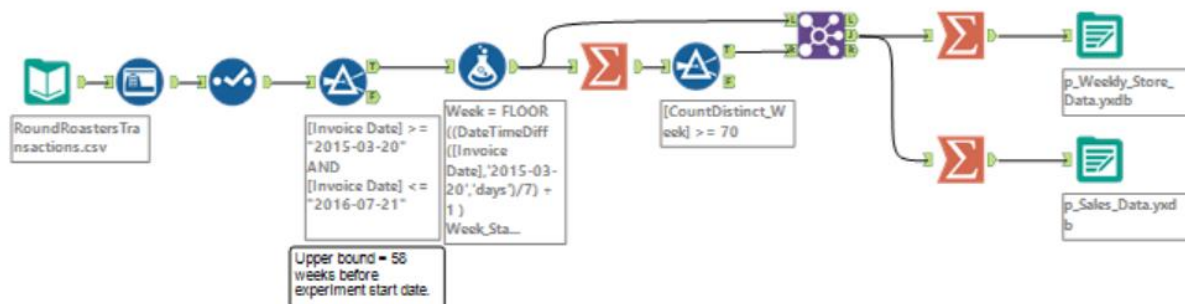
2. What is the test period?

   The test period is 12 weeks long ranging from '2016-29-04' to '2016-07-21'.

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

   Since we are running the test for 12 weeks, it would sense to aggregate the numbers on a weekly basis for every store. So Store ID and Week should be used to aggregate data.

Step 2: Clean Up Your Data

- Set appropriate formats & selected the required data i.e. data 58 weeks before (as required by Alteryx tools) '2016-29-04' to end of test date '2016-07-21'.
- Created Week, Week_Start, Week_End fields
- Aggregated by Store ID and Gross Margin
- Filtered out stores with data less than 76 weeks
- Joined with original data to get full information
- Aggregated to get invoices per week and total gross margin
- Output invoices per week data as p_Weekly_Store_Sales and total gross margin as p_Sales_Data

Step 3: Match Treatment and Control Units
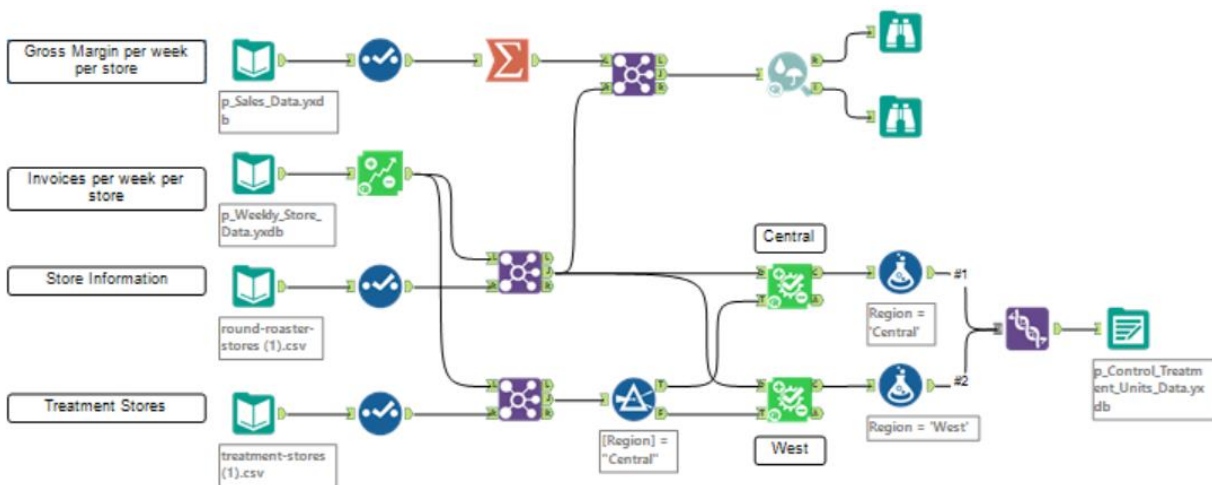
Apart from trend and seasonality...

1. What control variables should be considered?

   Trend, Seasonality, Sq_Ft, and AvgMonthSales.

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

   With respect to Sum_Gross_Margin, AvgMonthSales has high correlation of 0.99. Sq-Ft is least correlated at a value of -0.02.

Pearson Correlation Analysis *Full Correlation Matrix*

	Sum_Gross.Margin	AvgMonthSales	Trend	Seasonality	Sq_Ft
Sum_Gross.Margin	1.000000	0.988207	-0.066564	0.088777	-0.020453
AvgMonthSales	0.988207	1.000000	-0.132040	0.153059	-0.046967
Trend	-0.066564	-0.132040	1.000000	-0.772280	0.197444
Seasonality	0.088777	0.153059	-0.772280	1.000000	-0.229980
Sq_Ft	-0.020453	-0.046967	0.197444	-0.229980	1.000000

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

   The best control variables would be AvgMonthSales, Trend and Seasonality. Sq_Ft should not be considered due to very low correlation.

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

Treatment_Store	Control_Store_1	Control_Store_2
1664	11868	12019
1675	11818	3235
1696	2383	3102
1700	9968	8717
1712	9017	10568
2288	2568	7484
2293	7811	9589

2301	8362	9524
2322	1580	7284
2341	12286	7162

Step 4: Analysis and Writeup
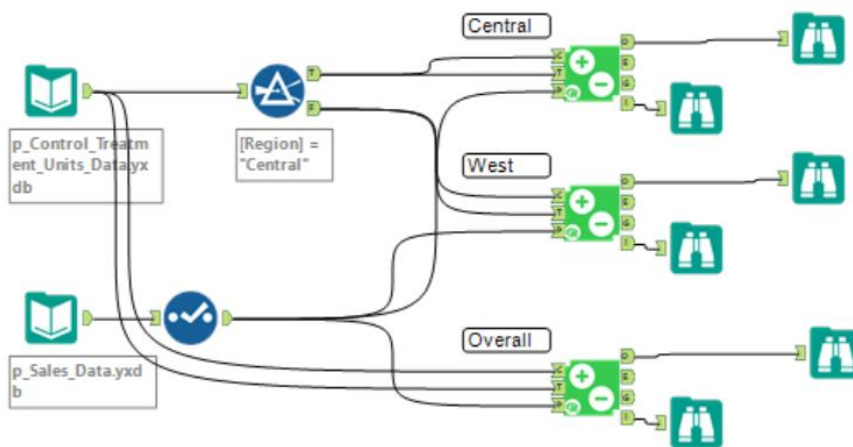
1. What is your recommendation - Should the company roll out the updated menu to all stores?

   To justify rolling out new menus, the company needed at least 18% growth in profitability. From our A/B test, we see an overall lift of 37%, so the company should definitely roll out the new menus in all the stores.

2. What is the lift from the new menu for West and Central regions?

   The lift for West region is 31.6% while the lift for Central region is 42.4% and both have a statistical significance of 99% and 99.5% respectively.

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

   The overall lift for the new menu is 37% with a statistical significance of 100%.