Project: Analyzing a Market Test

A/B Test a New Menu Launch

Step 1: Plan Your Analysis

1. **What is the performance metric you'll use to evaluate the results of your test?**
   Total gross margin; as identified in the business problem, Round Roasters stores management wants to decide on updating their menu by adding new products (gourmet sandwiches and limited wine offerings) and whether it will result in more profit for their stores, in comparison to their current menu.

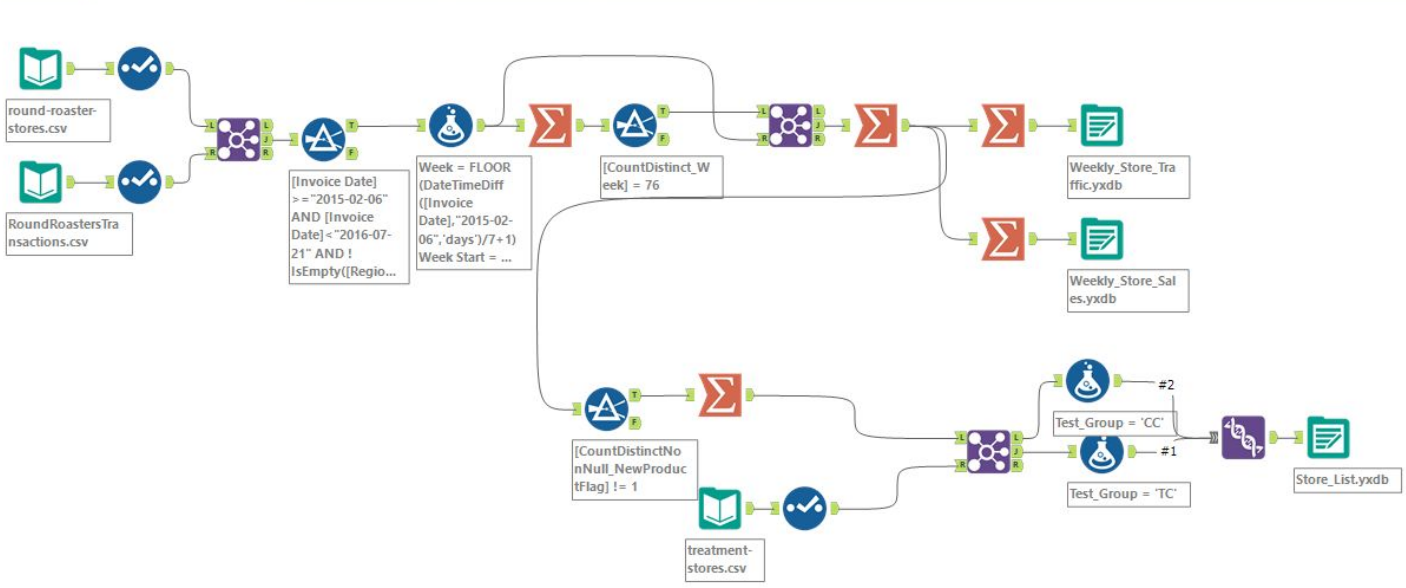
2. **What is the test period?**
   The test period was implemented for 12 weeks, from 29-Apr-2016 to 21-Jul-2016.

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

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.

1. Historical data for the experiment was selected based on the test period:
   Historical data for 52 weeks + 12 weeks period + 12 weeks test period = 76 weeks.
2. Invoice date >= 06-02-2015 AND Invoice date < 21-07-2016.
3. Remove all null values in Region column.
4. Aggregate data at a weekly level (week start - week end)
5. Identify new product by creating a newProductFlag value
6. Count weeks for each store and choose only those who have 76 weeks in total.



Step 3: Match Treatment and Control Units

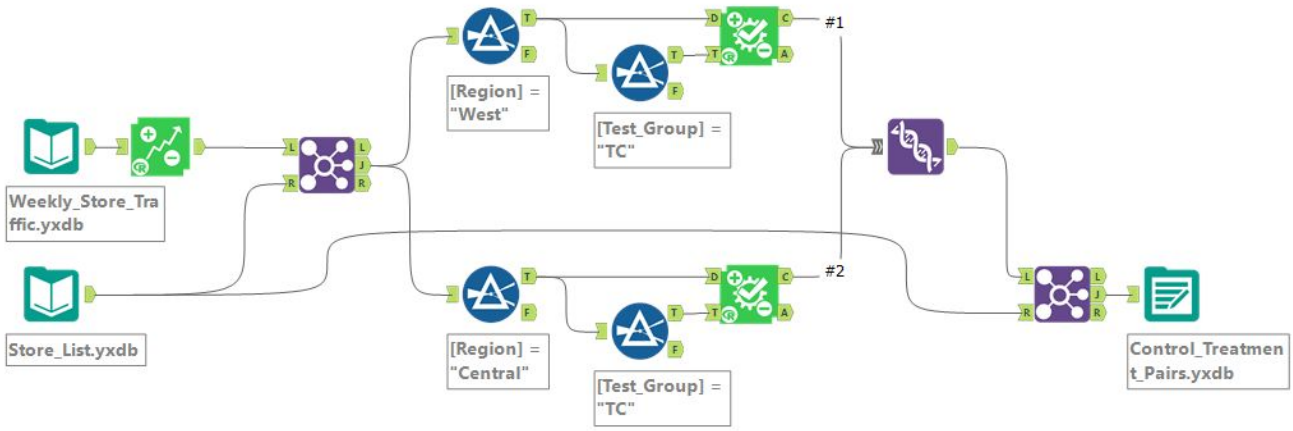
1. **What control variables should be considered? Note: Only consider variables in the RoundRoastersStore file.**
2. **What is the correlation between your each potential control variable and your performance metric?**
   When it comes to generating more profits (total gross margin per week), the obvious two factors from the given data are store size (Sq_Ft) and average monthly sales for each store. And the results of testing the correlation between gross margin and these two factors, shows that only the average monthly sales have a high correlation.

	FieldName	AvgMonthSales	Sq_Ft	Sum_Sum_Gross Margin
1	AvgMonthSales	1	-0.099233	0.787855
2	Sq_Ft	-0.099233	1	-0.062352
3	Sum_Sum_Gross Margin	0.787855	-0.062352	1

3. **What control variables will you use to match treatment and control stores?**
   - Trend
   - Seasonality
   - AvgMonthSales

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	9081	2568
2293	12219	9524
2301	3102	9238
2322	2409	3235
2341	12536	2383



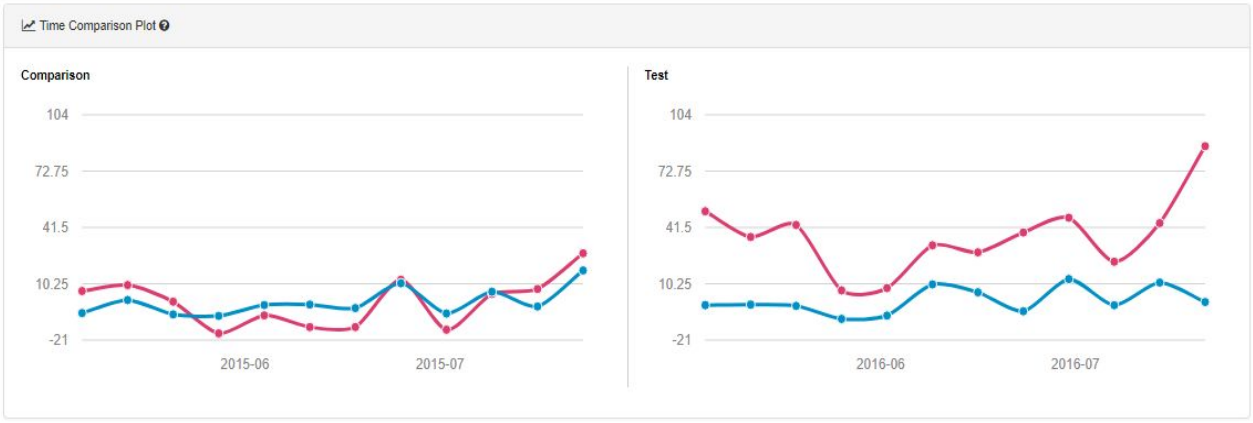
Step 4: Analysis and Writeup

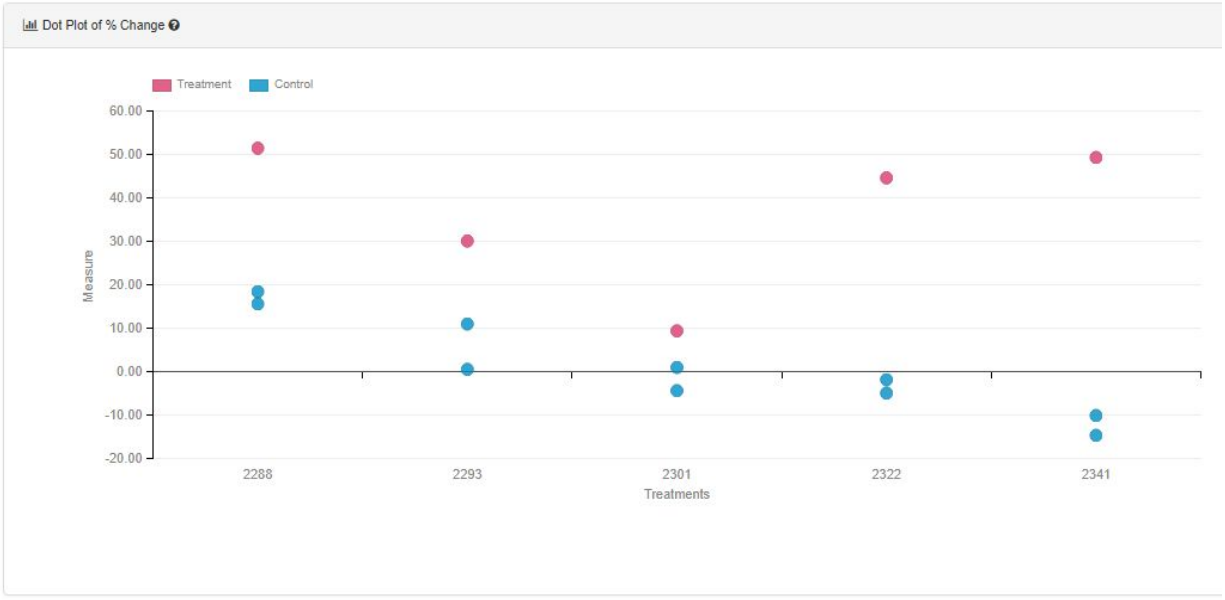
1. **What is your recommendation - Should the company roll out the updated menu to all stores?**
   Yes. The results of the test run on the provided data showed improvement in both test regions; hence an overall improvement in profits.

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

➢ **West Region Results:**

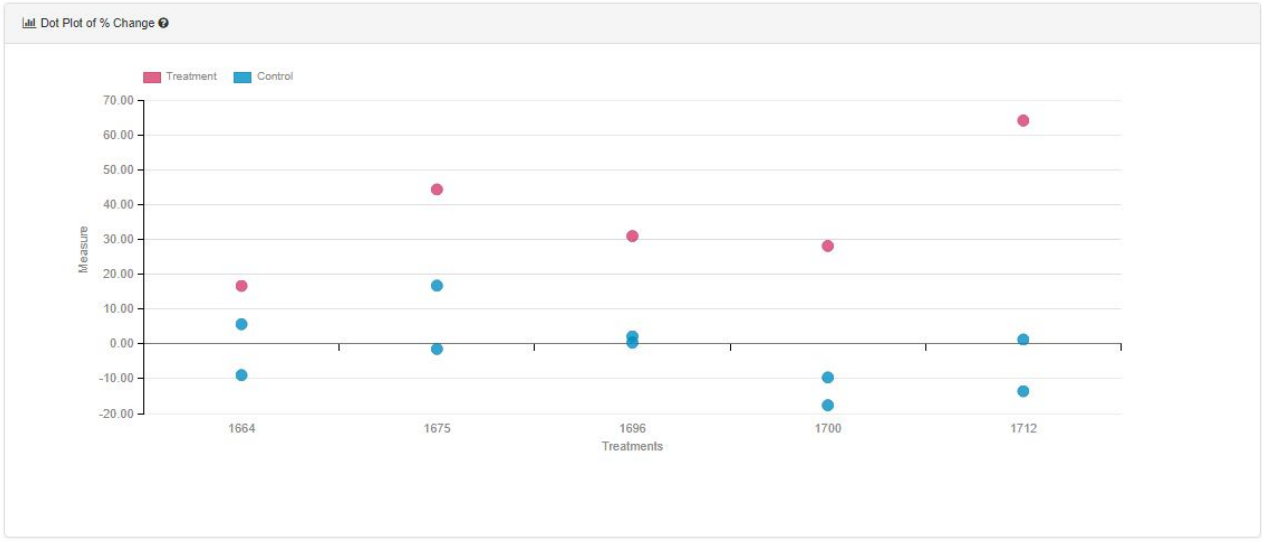
- Showed 36.9% improvement at a significance of 99.3%.
- The average lift would be 36.9% per store per week ~ $514.4 per store per week.
- Comparison plot results after implementing the test indicates that treatments stores performance was higher than control stores.
- The dot plot shows that all treatment stores did better than control stores.





➢ **Central Stores Results:**

- Showed 41.7% improvement at a significance of 99.4%.
- The average lift would be 41.7% per store per week ~ $802.6 per store per week.
- Comparison plot results after implementing the test indicates that treatments stores performance was higher than control stores.
- The dot plot shows that all treatment stores did better than control stores.



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

- Results showed 39.3% improvement at a significance of 100%.
- The average lift would be 39.3% per store per week ~ $658.5 per store per week.
- Comparison plot results after implementing the test indicates that treatments stores performance was higher than control stores.
- The dot plot shows that all treatment stores did better than control stores.