Project: Analyzing a Market Test

Step 1: Plan Your Analysis

To perform the correct analysis, you will need to prepare a data set. (500 word limit)
Answer the following questions to help you plan out your analysis:

1. What is the performance metric you'll use to evaluate the results of your test?
   Answer:
   Gross margin (Profit)
2. What is the test period?
   Answer:
   The test period is 29-04-2016 to 21-06-2016
3. At what level (day, week, month, etc.) should the data be aggregated?
   Answer:
   The data should be aggregated at the week 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.

The data was prepared and aggregated for further analysis.
Weekly sales data, Trend and seasonal data, and Control and treatment match were obtained.

Step 3: Match Treatment and Control Units

In this step, you should create the trend and seasonality variables, and use them along with you other control variable(s) to match two control units to each treatment unit. Note: Calculate the number of transactions per store per week to calculate trend and seasonality.
Apart from trend and seasonality...

1. What control variables should be considered? Note: Only consider variables in the RoundRoastersStore file.
   Answer:
   Average monthly sales should be considered as a control variable apart from trend and seasonality.
2. What is the correlation between your each potential control variable and your performance metric?
   Answer:

FieldName	Gross Margin	Sq_Ft	AvgMonthSales
Gross Margin	1	-0.007227	0.008622
Sq_Ft	-0.007227	1	-0.099233
Avg MonthSales	0.008622	-0.099233	1

3. What control variables will you use to match treatment and control stores?
   Answer:
   Trend, Seasonality, and Average monthly sales will be used the match treatment and control stores.

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

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

Step 4: Analysis and Writeup

Conduct your A/B analysis and create a short report outlining your results and recommendations. (250 words limit)

Answer these questions. Be sure to include visualizations from your analysis:

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

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

   Answer:
   The lift from the menu for the West region is 37.9 with a significance of 99.5 whilst that of the Central region is 43.5 with a significance of 99.6
   This shows that the introduction of the new menu, showed 37.9% improvement (approximately $526 per store per week) at a significance of 99.5% in the West Region and 43.5% improvement (approximately $835.9 per store per week) with a significance 99.6% in the Central Region as shown in the pictures below.
   West Region

AB Test Analysis for Sum_Gross Margin

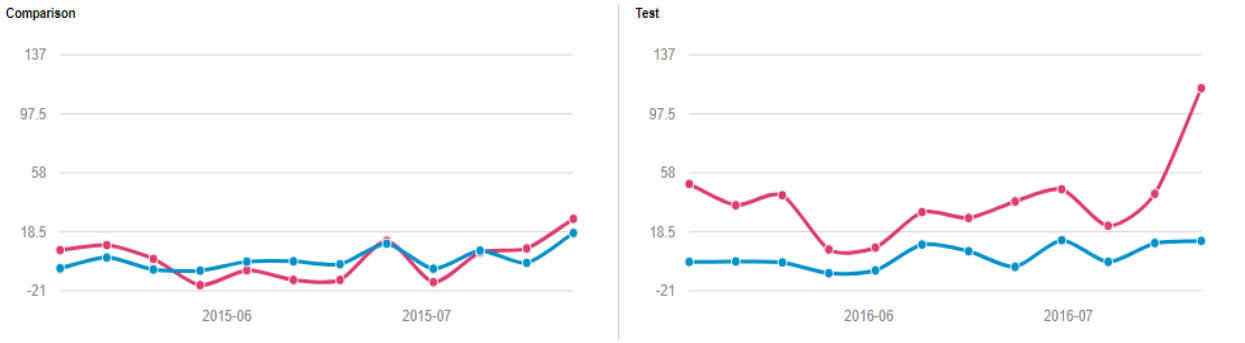
Time: 2021-09-09 12:33:32

37.9
Average Lift, %

526.5
Expected Impact, Sum_Gross Margin

99.5
Significance Level, %

Time Comparison Plot



Central Region

AB Test Analysis for Sum_Gross Margin

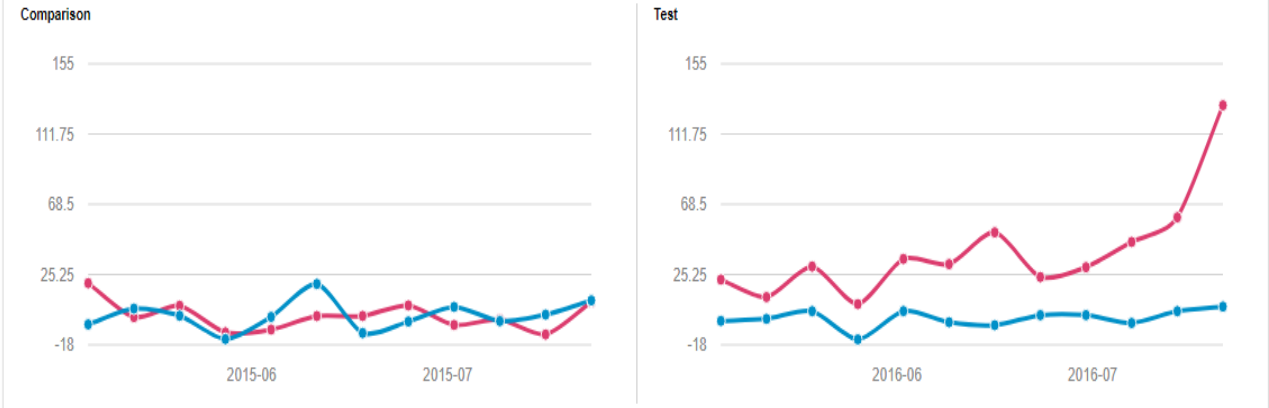
Time: 2021-09-09 12:35:29

43.5
Average Lift, %

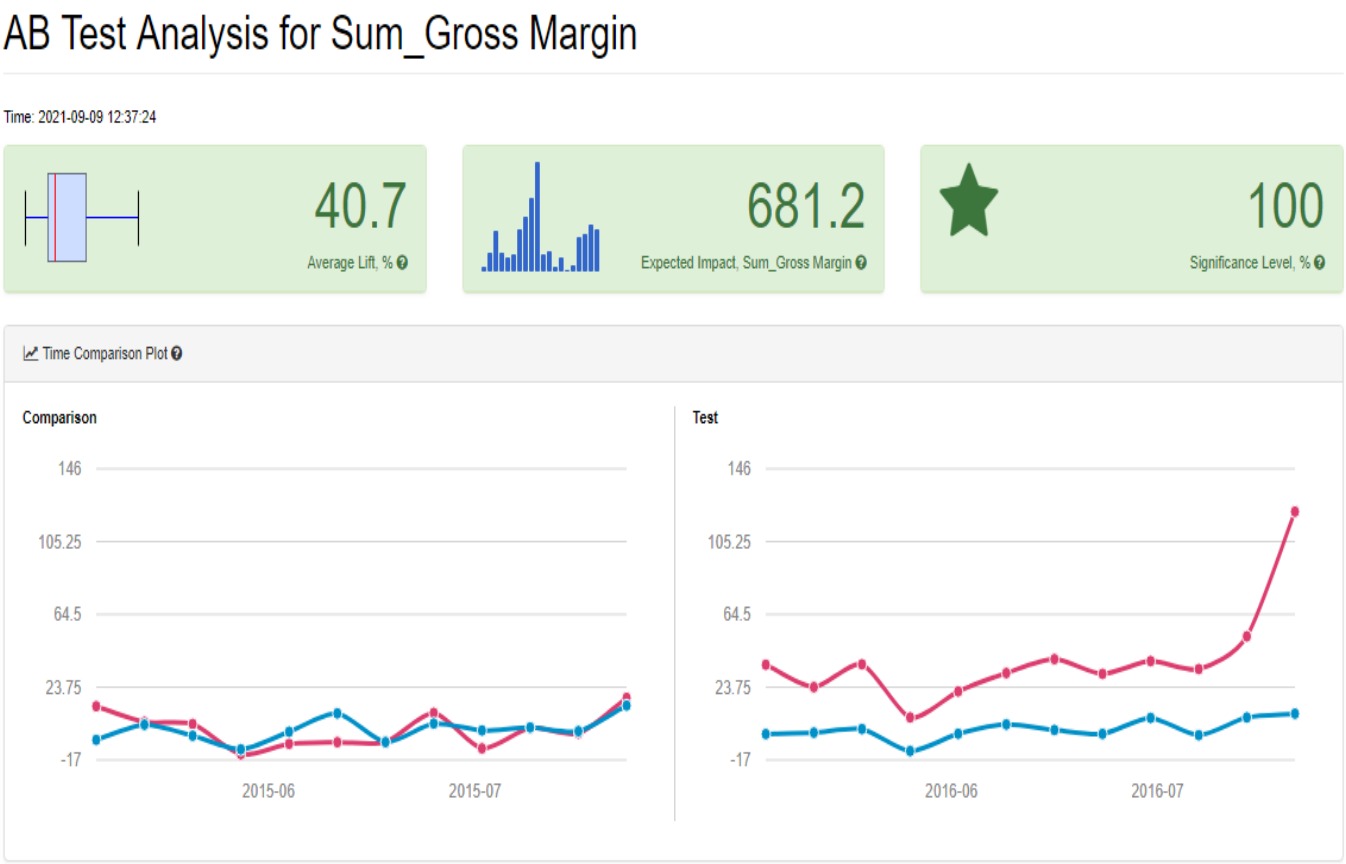
835.9
Expected Impact, Sum_Gross Margin

99.6
Significance Level, %

Time Comparison Plot



3. What is the lift from the new menu overall?
   The lift from the menu overall is 40.7% with a significance of 100. This is to say that, overall, the introduction of the new menu, brought 40.7% improvement (approximately $681.2 per store per week) at a significance of 100%.



Considering the level of improvement brought by the introduction of the new menu in the treatment stores, the new menu should be rolled out to the entire stores.