Project: Analyzing a Market Test

The following project entitles a thorough analysis of Round Roasters coffee restaurant after the introduction of a new menu in their outlets. This introduction must justify sizable sales needed to facilitate its rollout across all stores owned by the chain.

Step 1: Plan Your Analysis

1. What is the performance metric you'll use to evaluate the results of your test?

An 18% increase in profit is needed to justify the rollout of the new menu across other stores. Hence, we select gross profit as a metric needed to evaluate our results.

2. What is the test period?

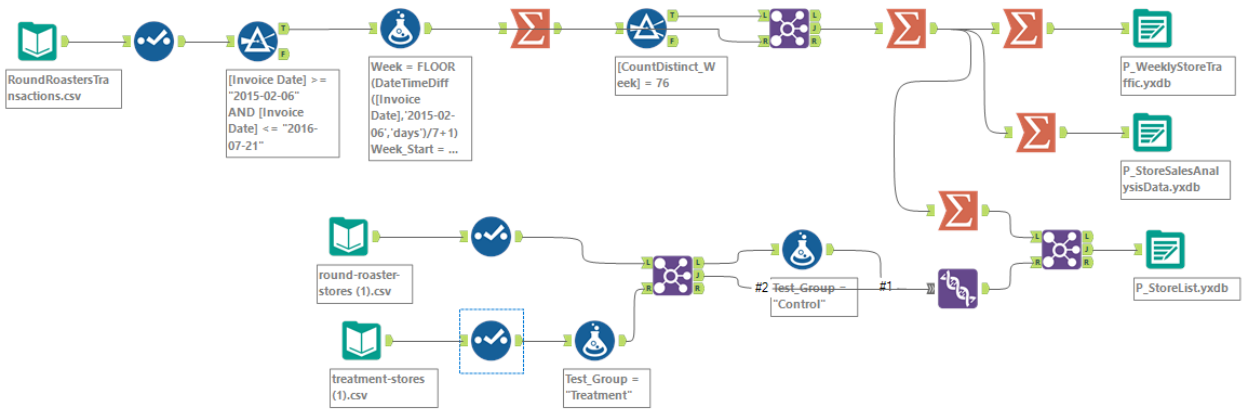
The test ran for a period of 12 weeks (2016-April-29 to 2016-July-21) where five stores in each of the test markets offered the updated menu along with television advertising.

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

The data needs to be aggregated on week basis.

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.



Data Preparation Workflow

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?

The control variables that needs to be considered are the Sq_ft and AvgMonthSales.

2. What is the correlation between each potential control variable and your performance metric?
3. What control variables will you use to match treatment and control stores?

Pearson Correlation Analysis

Full Correlation Matrix

	Sq_Ft	AvgMonthSales	Sum_Sum_Sum_Gross.Margin
Sq_Ft	1.000000	-0.046967	-0.024224
AvgMonthSales	-0.046967	1.000000	0.990978
Sum_Sum_Sum_Gross.Margin	-0.024224	0.990978	1.000000

Matrix of Corresponding p-values

	Sq_Ft	AvgMonthSales	Sum_Sum_Sum_Gross.Margin
Sq_Ft		0.59138	0.78196
AvgMonthSales	0.59138		0.00000
Sum_Sum_Sum_Gross.Margin	0.78196	0.00000	

From the correlation matrix shows above it is evident that the AvgMonthSales having p-value < 0.05 is statistically significant. The AvgMonthSales with a value of 0.99 signifies a high degree of correlation with the Gross Margin. On the other hand, the Sq.-Ft with a correlation value of -0.024 is weakly correlated with the Gross Margin. Hence, we select the AvgMonthSales (besides the trend & Seasonality) to be the control variables needed to match the 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
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

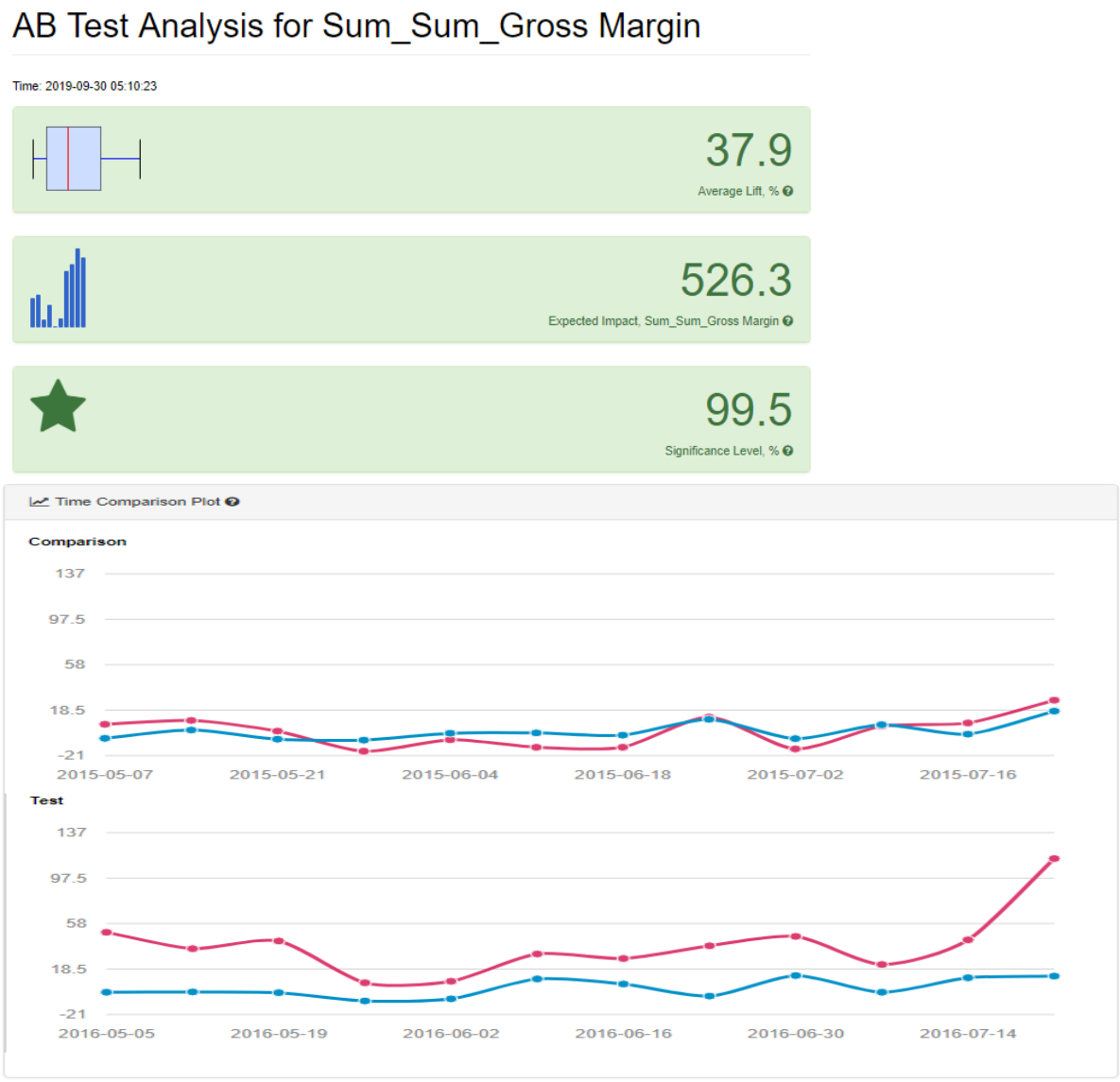
Answer these questions. Be sure to include visualizations from your analysis:

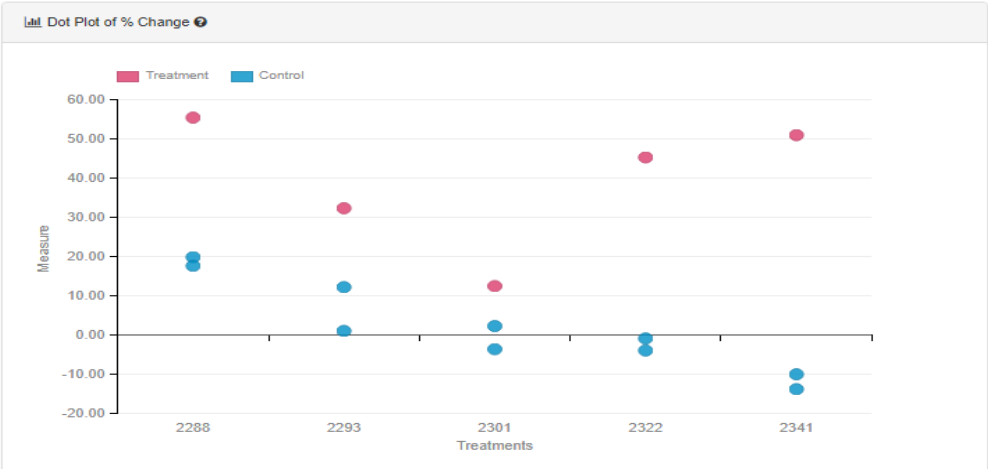
1. What is your recommendation - Should the company roll out the updated menu to all stores?

The company should go ahead with the roll out of the updated menu because the lift from the Central Region is 43.5% and 37.9% from the West Region, which combined gives us a lift percentage of 40.7% which is more than the 18% threshold set by the firm.

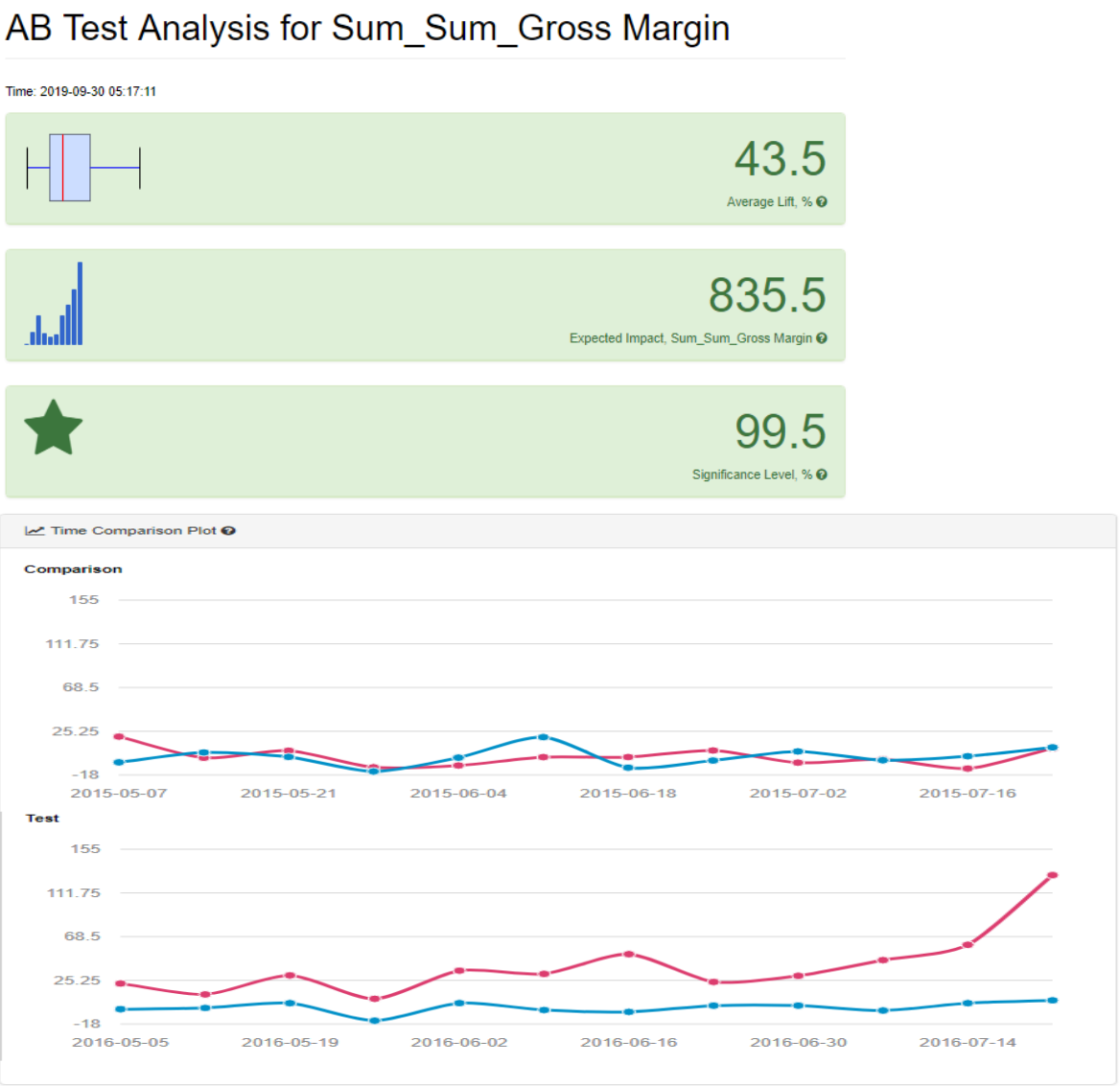
2. What is the lift from the new menu for West and Central regions (include statistical significance)?

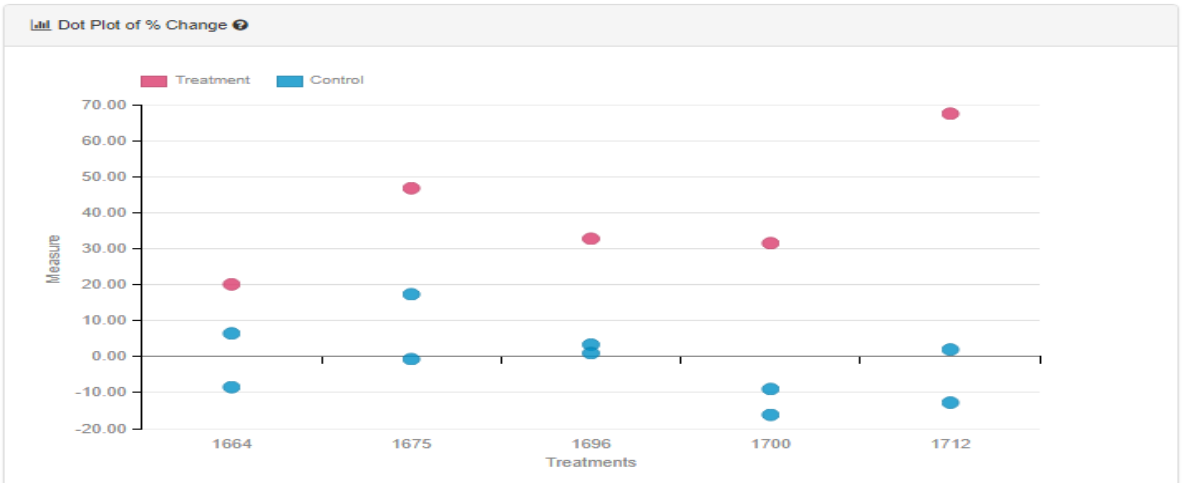
West Region: 37.9% (Significance Level – 99.5%)





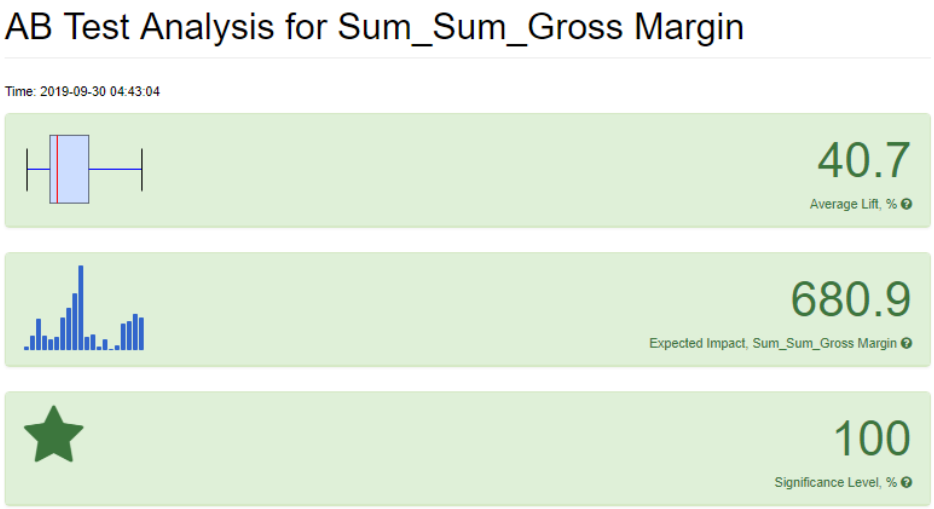
Central Region – 43.5% (Signficance Level – 99.5%)





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

Overall – 40.7% (Significance Level - 100%)



Dot Plot of % Change