Project: Analyzing a Market Test

Complete each section. When you are ready, save your file as a PDF document and submit it here.

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?
   Performance metric will include increasing profit to evaluate the result of test. profit is represented in the gross_margin variable. **Gross margin** is the performance metric used to evaluate the results of the test.

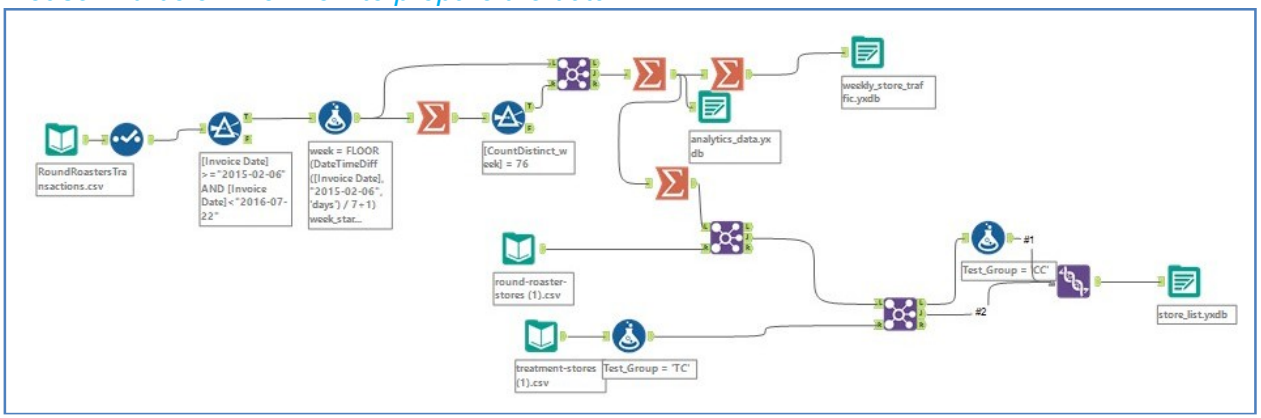
2. What is the test period?
   12 weeks (2016-April-29 to 2016-July-21)

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

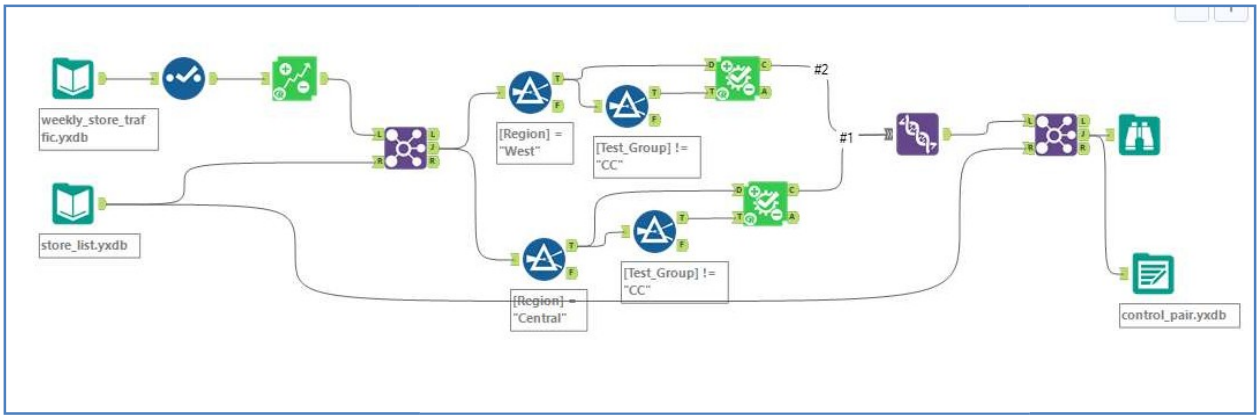
Please find below workflow to prepare the data.



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.

Please find below workflow for A/B Trends and A/B Control:



Apart from trend and seasonality...

1. What control variables should be considered? Note: Only consider variables in the RoundRoastersStore file.
   AvgMonthSales and Sq_Ft should be considered as control variable. We use the region to separate the stores before matching the control treatment pairs.

2. What is the correlation between your each potential control variable and your performance metric?
   Looking into below correlation matrix, AvgMonthSales and Sq_Ft with the performance metric gross margin.It has been observed that Sq_ft has a negative correlation and Average monthly sales has a positive correlation. As per below the Pearson Correlation Analysis , AvgMonthSales is statistically significant because the p-value < 0.05. So Average monthly sales is used as a control variable to match our treatment and control stores.

Pearson Correlation Analysis

Focused Analysis on Field Sum_Sum_Gross.Margin

	Association Measure	p-value	
AvgMonthSales	0.990982	0.00000	***
Sq_Ft	-0.024255	0.78168	

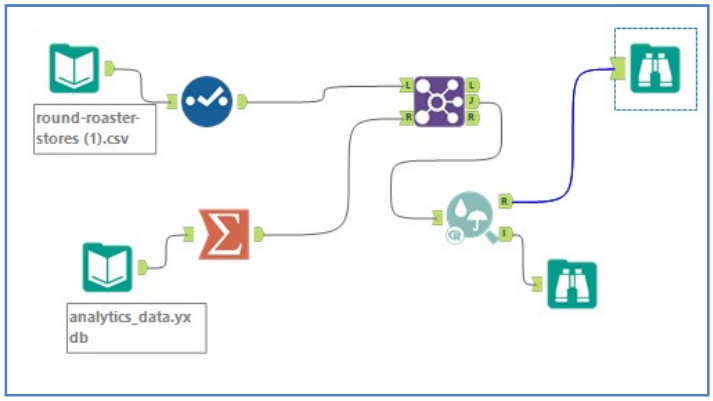
Full Correlation Matrix

	Sum_Sum_Gross.Margin	Sq_Ft	AvgMonthSales
Sum_Sum_Gross.Margin	1.000000	-0.024255	0.990982
Sq_Ft	-0.024255	1.000000	-0.046967
AvgMonthSales	0.990982	-0.046967	1.000000

Matrix of Corresponding p-values

	Sum_Sum_Gross.Margin	Sq_Ft	AvgMonthSales
Sum_Sum_Gross.Margin		0.78168	0.00000
Sq_Ft	0.78168		0.59138
AvgMonthSales	0.00000	0.59138	

Please find below workflow for correlation matrix.



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

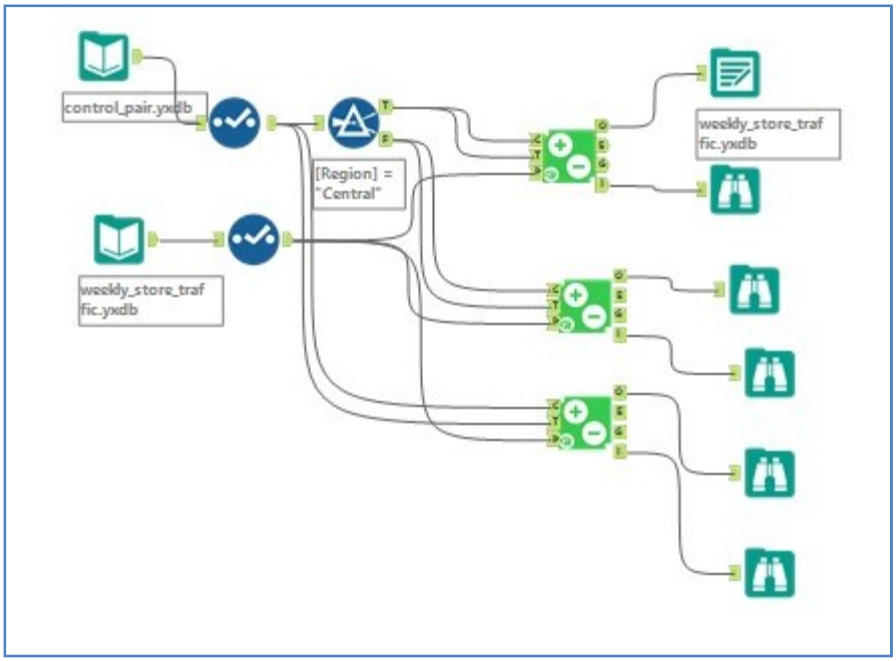
As mentioned in above, **Trend, Seasonality, Average monthly sales** is used as a control variable to match our treatment and control stores.

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

Treatments	Control1	Comtrol2
1664	1964	7162
1675	2214	7284
1696	1863	7334
1700	2014	7037
1712	7434	8162
2288	2568	9081
2293	12686	9639
2301	12536	9238
2322	3185	9388
2341	12586	2572

Step 4: Analysis and Writeup

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



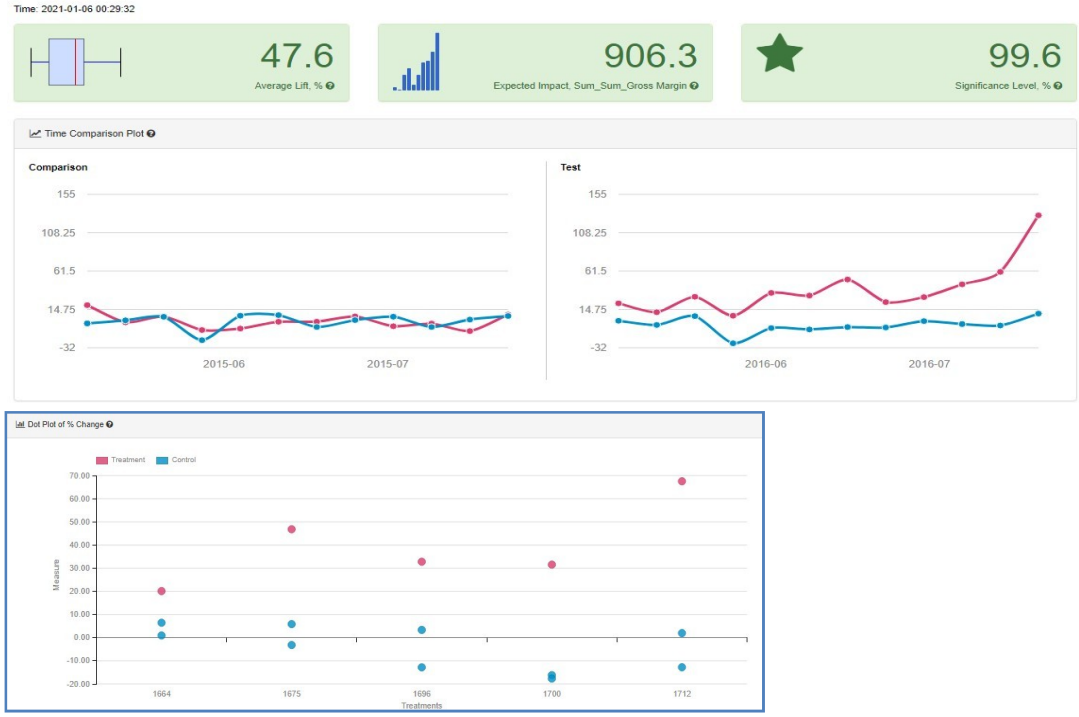
Answer these questions. Be sure to include visualizations from your analysis:

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

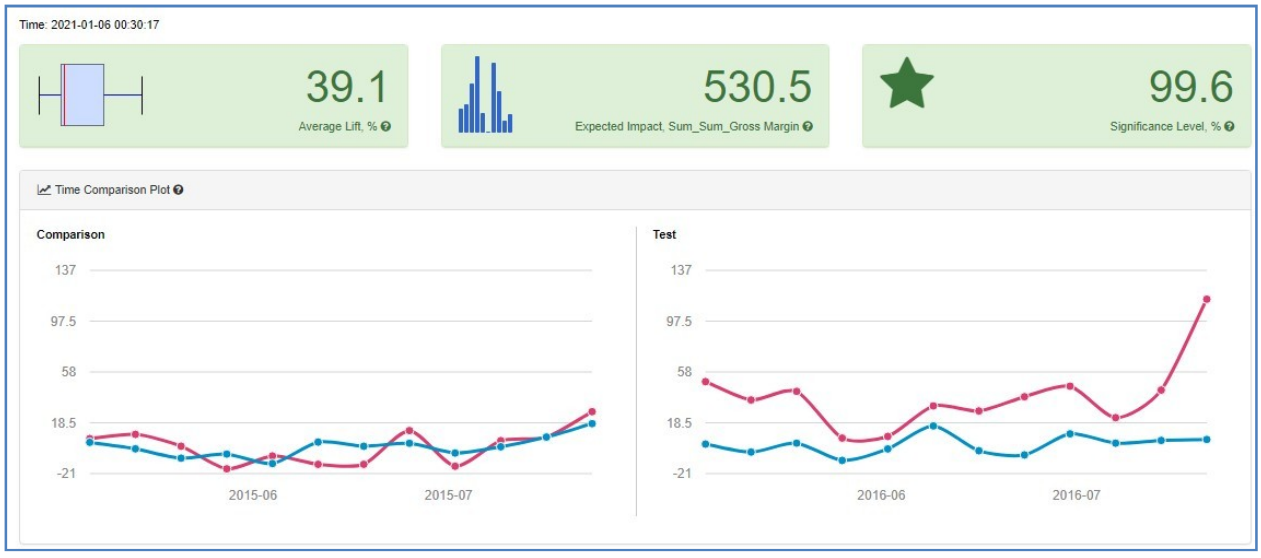
2. What is the lift from the new menu for West and Central regions (include statistical significance)?
   The lift from the new menu in Central Region is 47.6% with a statistical significance of

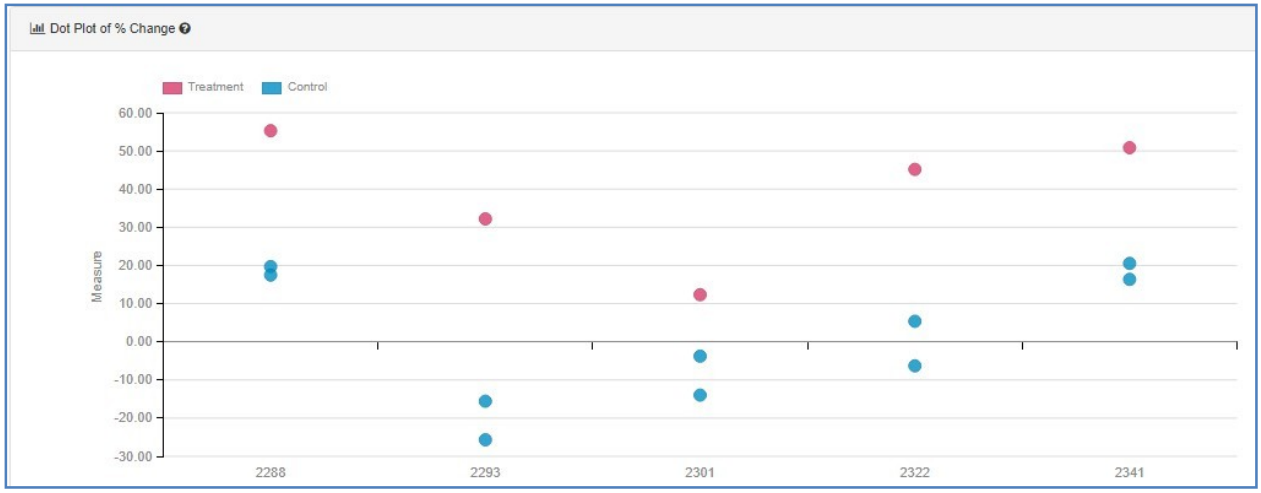
99.6, and the lift from the new menu in West Region is 39.1% with a statistical significance of 99.6%,Overall, lift from the new menu is 43.4%

Central :



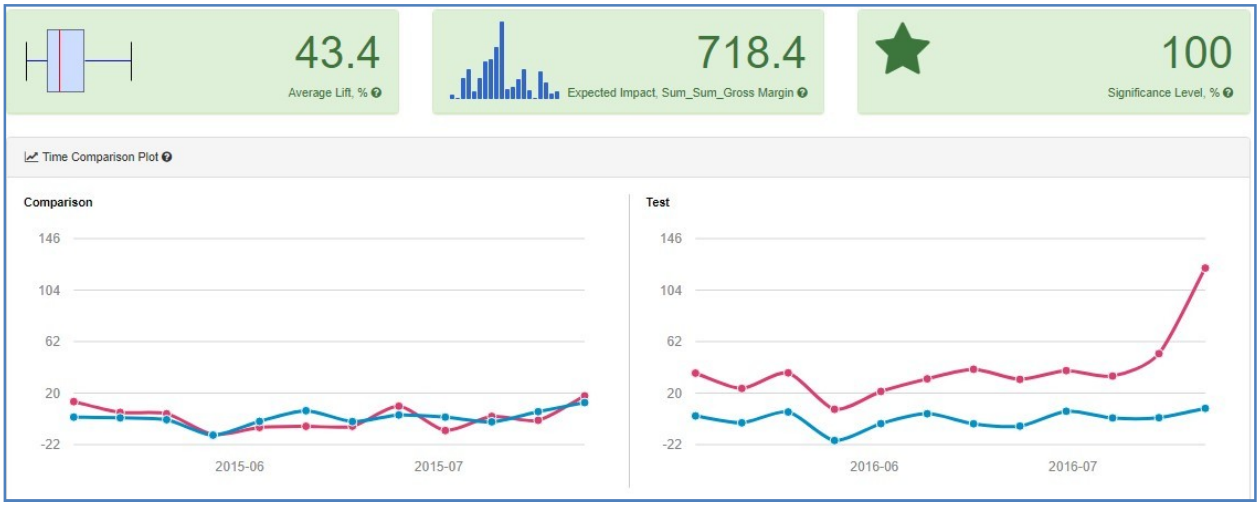
West:

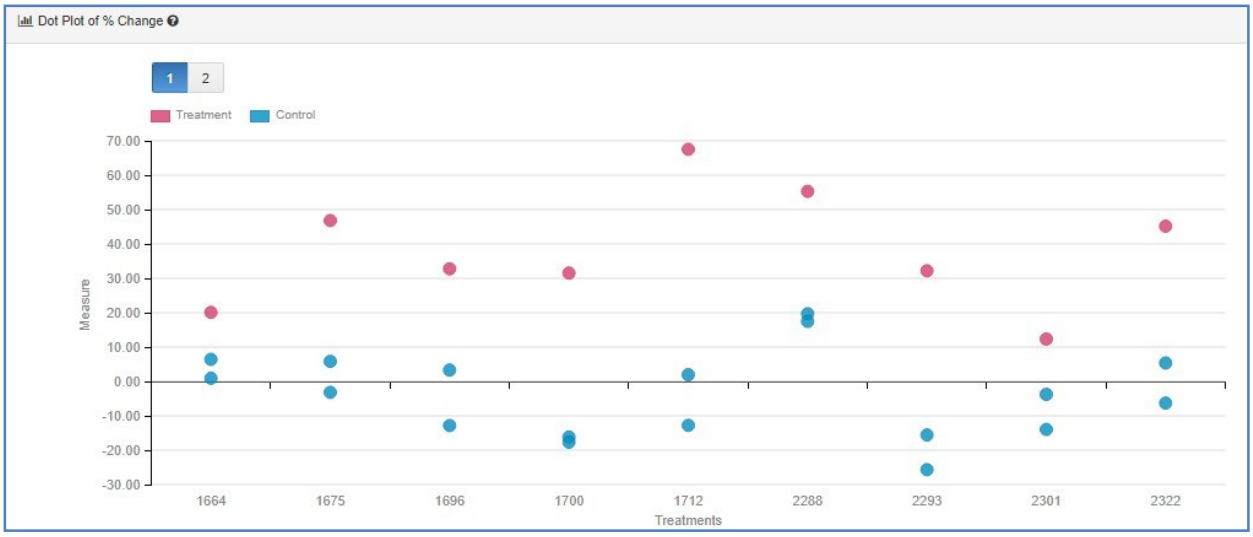


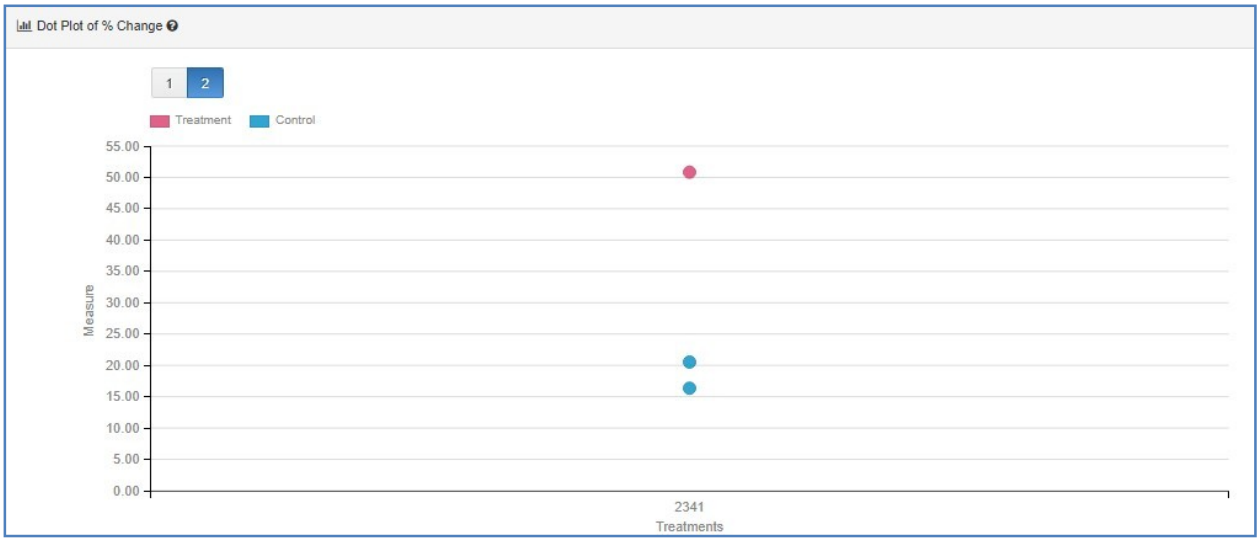


3. What is the lift from the new menu overall?

The lift from the new menu in Central Region is 47.6% with a statistical significance of 99.6, and the lift from the new menu in West Region is 39.1% with a statistical significance of 99.6%,Overall, lift from the new menu is 43.4%




Dot Plot of % Change
1
2
Treatment
Control
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
-20.00
-30.00
Measure
1664
1675
1696
1700
1712
2288
2293
2301
2322
Treatments


Dot Plot of % Change
1
2
Treatment
Control
55.00
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Measure
2341
Treatments