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?
   The performance metric I will be using to evaluate the results of this test is incremental lift in foot traffic to the stores with the new menu. Foot traffic will be measured by looking at the number of unique invoices per week. To identify if gross margin/profit of the treatment stores vs the control stores.
2. What is the test period?
   The test period was a 12-week span from 4/29/2016 – 7/21/2016 and 5 stores per test market were treatment stores (Denver/Chicago).
3. At what level (day, week, month, etc.) should the data be aggregated?
   The data should be aggregated on a weekly level.

Step 2: Clean Up Your Data

Filters:

- Filtered Region on West and Central
- Invoice Dates: 4/29/2015 to 7/21/2016
- Aggregated by store to the weekly level
  - Included weekly gross margin, count distinct invoices
- Added a Week fields
- Added WeekEnd and WeekStart fields

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.

- Region: The store should match to a store in the same region
- Avg Monthly Sales: the store should have similar monthly sales
- Trend: the store should have similar Trend in foot traffic
- Seasonality: the store should have similar seasonality in foot traffic

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

- **Avg Month Sales** is the highest correlated variable to our performance metric (gross margin)
    - SqFt: -0.038
    - AvgMonthSales: 0.996
    - Invoices: 0.983

Pearson Correlation Analysis

Full Correlation Matrix

	Sq_Ft	AvgMonthSales	Sum_Sum_Gross.Margin	Sum_CountDistinct_Invoice.Number
Sq_Ft	1.0000000	-0.0469674	-0.0379736	-0.0059422
AvgMonthSales	-0.0469674	1.0000000	0.9965787	0.9798067
Sum_Sum_Gross.Margin	-0.0379736	0.9965787	1.0000000	0.9829381
Sum_CountDistinct_Invoice.Number	-0.0059422	0.9798067	0.9829381	1.0000000

Matrix of Corresponding p-values

	Sq_Ft	AvgMonthSales	Sum_Sum_Gross.Margin	Sum_CountDistinct_Invoice.Number
Sq_Ft		0.59138	0.66432	0.94588
AvgMonthSales	0.59138		0.00000	0.00000
Sum_Sum_Gross.Margin	0.66432	0.00000		0.00000
Sum_CountDistinct_Invoice.Number	0.94588	0.00000	0.00000	

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

- I will use:
    AvgMonthSales
    Trend
    Seasonality

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

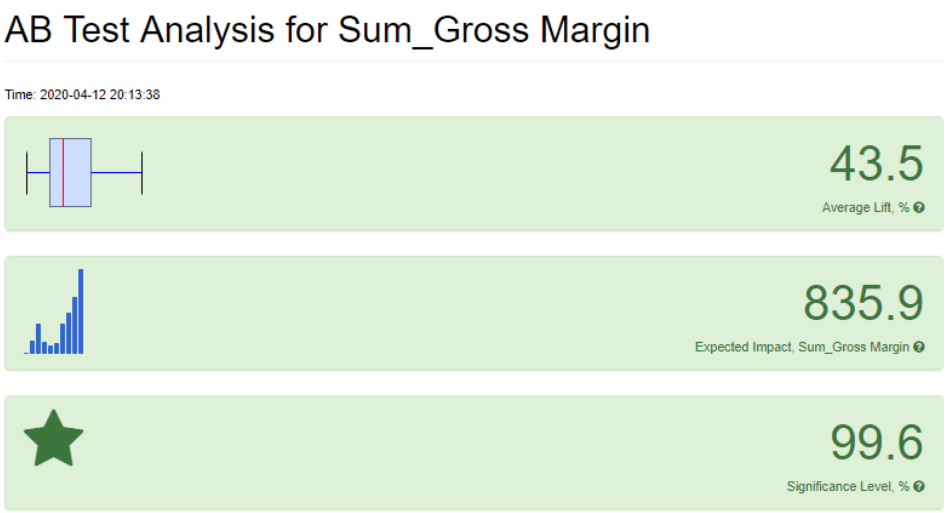
Step 4: Analysis and Writeup

My recommendation is to roll out the new menu to all stores. Central region sees an incremental lift of 43.5% to gross margins and the West region sees a 37.9% increase to gross margins. Both of these incremental lifts are greater than the 18% minimum required to execute the new menu to other stores.

CENTRAL REGION

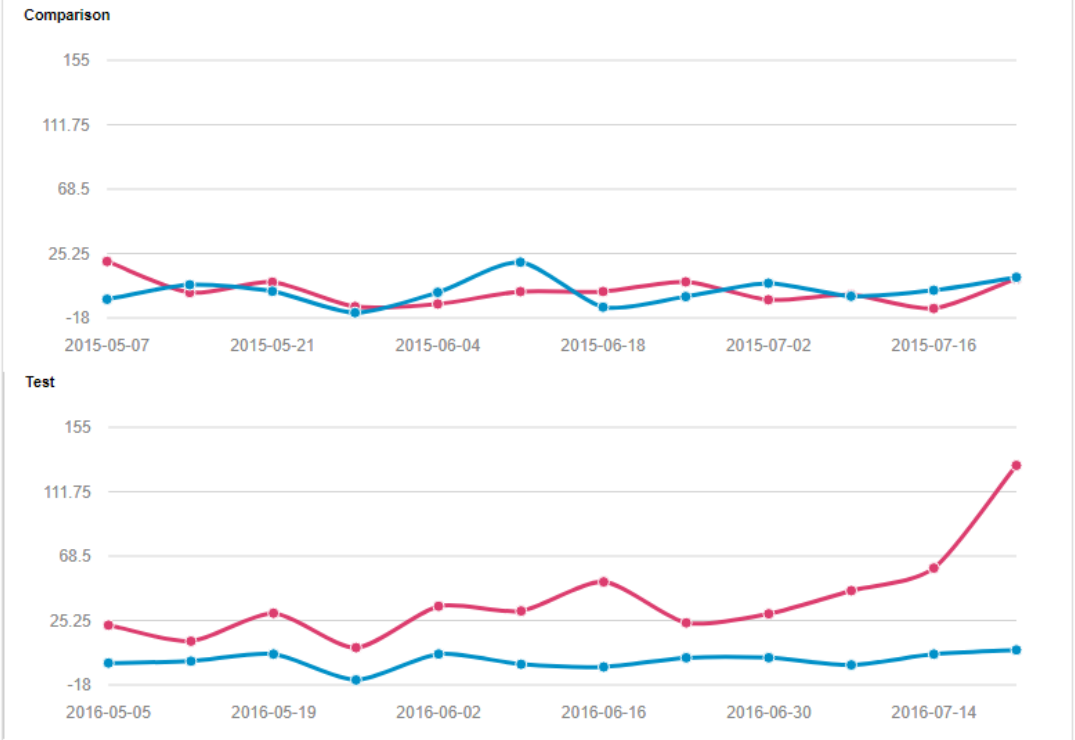
- **The lift to the central region is a 43.5% average lift to treatment compared to control.**
- **There is a significance of 99.6%. This means that there is a very low chance that these results occurred because of random chance**
- **The time comparison chart shows that treatment and control both performed at relatively the same in regards to gross margin. During the experimental period there is a noticeable increase to gross margins**
- **The dot plot of percent change shows the treatment group consistently beating both the control stores**

Visualizations/Reports for Central Region

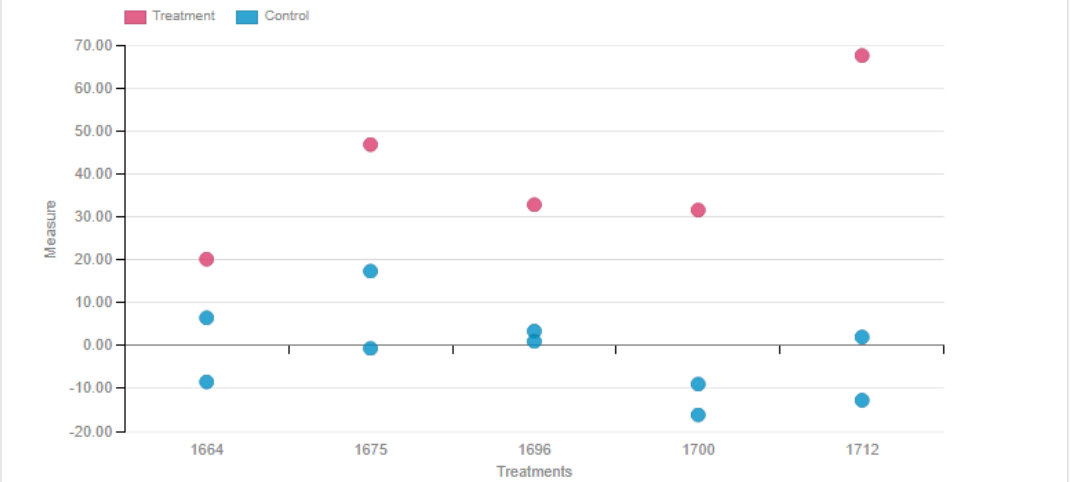


Central Region Cont.

Time Comparison Plot



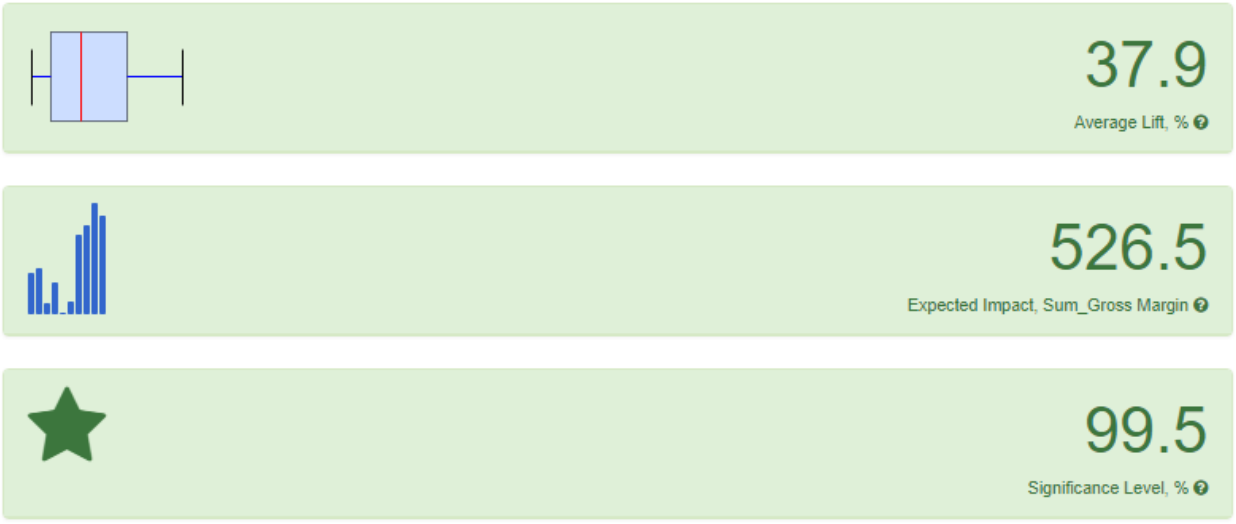
Dot Plot of % Change



WESTERN REGION

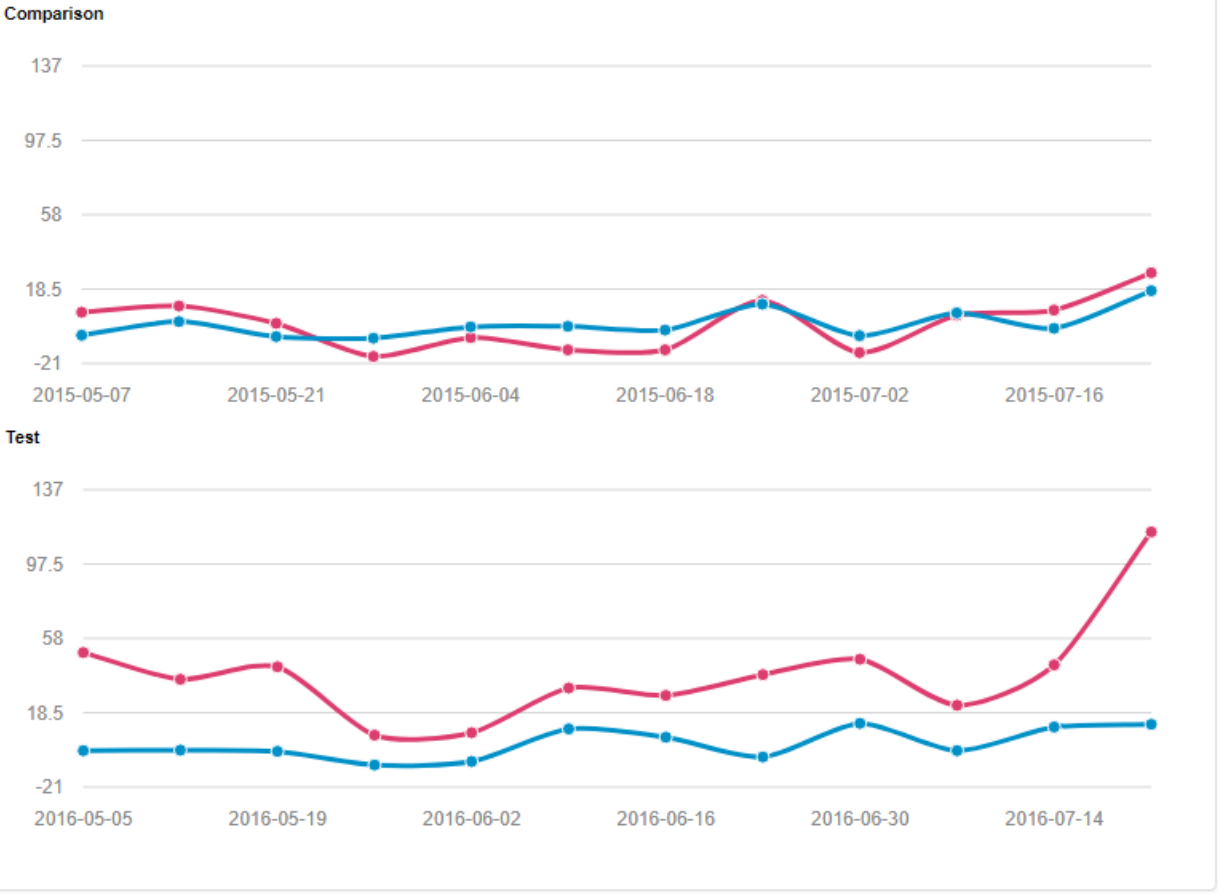
- **The lift to the western region is a 37.9% average lift to treatment compared to control.**
- **There is a significance of 99.5%. This means that there is a very low chance that these results occurred because of random chance**
- **The time comparison chart shows that treatment and control both performed at relatively the same in regards to gross margin. During the experimental period there is a noticeable increase to gross margins**
- **The dot plot of percent change shows the treatment group consistently beating both the control stores**

Visualizations/Reports for Western Region

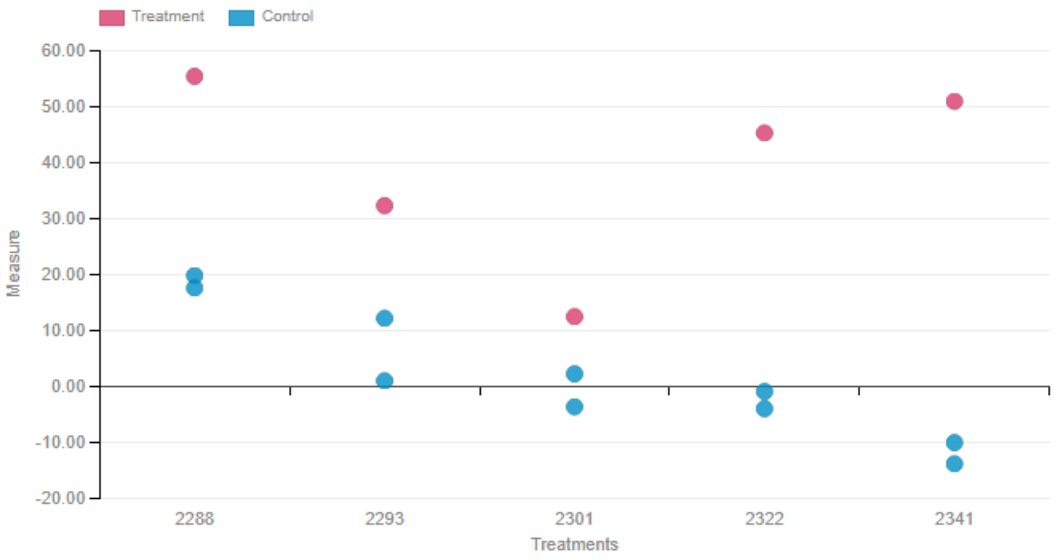


Western Region Cont.

Time Comparison Plot

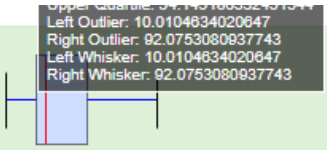


Dot Plot of % Change



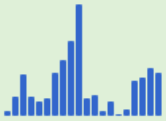
OVERALL PERFORMANCE

- **The lift overall is a 40.7% average lift to treatment compared to control.**
- **There is a significance of 100%. This means that there is essentially confirmed statistically that these results did not happen by random chance.**
- **These are great results and management should open the new menu to all stores**



40.7

Average Lift, %



681.2

Expected Impact, Sum_Gross Margin

100

Significance Level, %