# 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 to be used to evaluate the results of my test is the weekly gross margin
2. What is the test period?
   The test period is from April 29, 2016 to June 21, 2016
3. At what level (day, week, month, etc.) should the data be aggregated?
   Data should 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.*

## 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.
   **AvgMonthSales** and **Sq_Ft** should be considered as control variables.
2. What is the correlation between your each potential control variable and your performance metric?

*Full Correlation Matrix*

| | Sq_Ft | AvgMonthSales | Latitude | Longitude | Sum_Gross.Margin |
|---|---|---|---|---|---|
| Sq_Ft | 1.000000 | -0.052161 | 0.999998 | 0.083126 | 0.082776 |
| AvgMonthSales | -0.052161 | 1.000000 | -0.052132 | -0.256769 | 0.788853 |
| Latitude | 0.999998 | -0.052132 | 1.000000 | 0.082817 | 0.082564 |
| Longitude | 0.083126 | -0.256769 | 0.082817 | 1.000000 | 0.080610 |
| Sum_Gross.Margin | 0.082776 | 0.788853 | 0.082564 | 0.080610 | 1.000000 |

3. What control variables will you use to match treatment and control stores?
   The **Gross Margin** is strongly correlated with **AvgMonthSales** with a correlation value of 0.79.

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 |

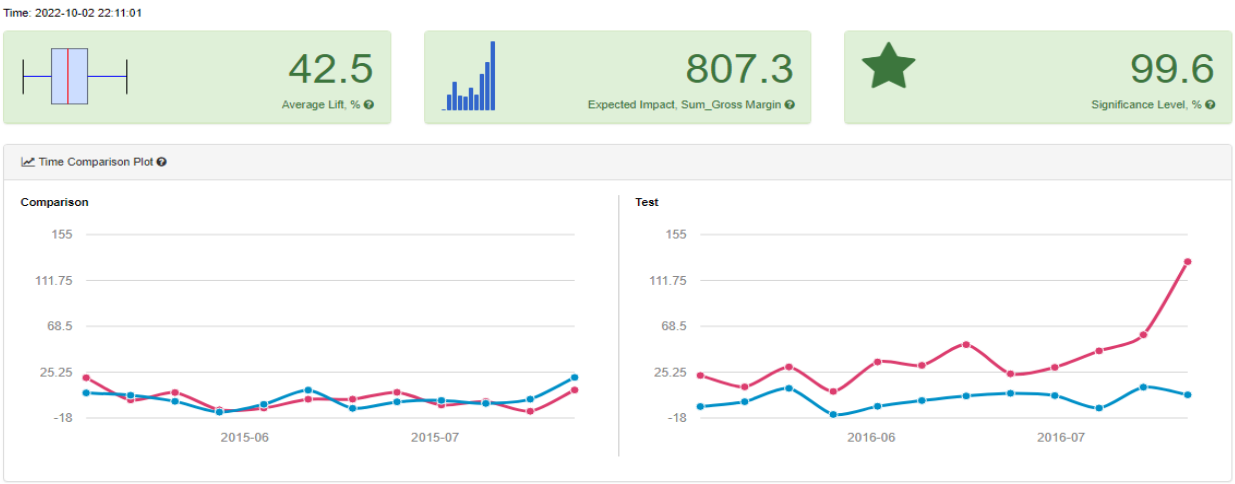
## Step 4: Analysis and Writeup

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

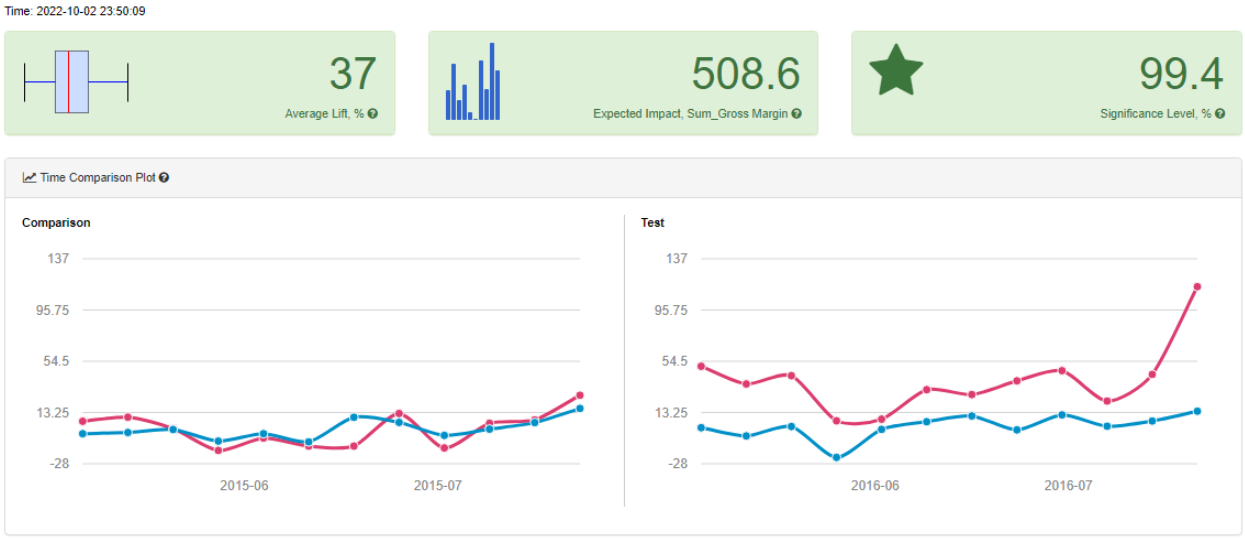
*Answer these questions. Be sure to include visualizations from your analysis:*

1. What is your recommendation - Should the company roll out the updated menu to all stores?
   Yes, the company should roll out the updated menu to all stores, given that the potential return on investment **(40%)** will be much larger than the required returns of 18%

2. What is the lift from the new menu for West and Central regions (include statistical significance)?
   **a. Central Region**
   With reference to the image below, the Central region will get a 42.5% lift in Weekly Gross Margins if the new menu is rolled out to all stores. The chances of this are highlighted with the 99.6% significance level.



**b. West Region**
Average Lift is 37% and the Significance Level is 99.4%. See the A/B Test analysis model and report below:




3. What is the lift from the new menu overall?
In a total of 133 restaurants, there are 91 in the West and 42 in the Central region.
Overall lift is, $(91*37.0\%+42*42.5\%)/133=$ **39.4%**

## Before you Submit

Please check your answers against the requirements of the project dictated by the rubric here. Reviewers will use this rubric to grade your project.