# Project 5: Analyzing a Market Test

## Step 1: Plan Your Analysis

1. What is the performance metric you'll use to evaluate the results of your test?
   The performance metric used to evaluate the results is the sum of the gross margin to decide on whether the TV ad campaign will have an impact on sales. If so, the newly updated menu will be available in all stores of Round Roasters.

2. What is the test period?
   The test period is between 2016-April-29 to 2016-July-21, which is about 12 weeks.

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

## Step 2: Clean Up Your Data

In this step, I prepared the data by aggregating the transaction data to the weekly level with the appropriate dates. We were given a file for transaction data for all stores from 2015-January-21 to 2016-August-18 but we only needed 76 weeks of data, that is between 2015-Feb-06 and 2016-Jul-22.

I resumed all this by creating a weekly-store-traffic file and a store-weekly-sales file.
Then I created a store-list file that group all the stores with a treatment or control flag for each store.

## Step 3: Match Treatment and Control Units

1. What control variables should be considered? Note: Only consider variables in the RoundRoastersStore file.
   The only variable that should be considered beside storeId and region is the AvgMonthSales. The other variables are not to be considered.

2. What is the correlation between your each potential control variable and your performance metric?
   We can see that AvgMonthSales has a high correlation of 0.91 with the Sum of Gross Margin. But, *square_ft*has a poor correlation of -0.03.

| | Sum_Gross.Margin | Sum_AvgMonthSales | Sq_Ft |
|---|---|---|---|
| Sum_Gross.Margin | 1.0000000 | 0.9146331 | 0.0064826 |
| Sum_AvgMonthSales | 0.9146331 | 1.0000000 | -0.0298687 |
| Sq_Ft | 0.0064826 | -0.0298687 | 1.0000000 |

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

I will use AvgMonthSales with Trend and Seasonality when matching treatment and control stores.

4. 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 | 11219 | 9524 |
| 2301 | 3102 | 9238 |
| 2322 | 2409 | 3235 |
| 2341 | 12536 | 2383 |

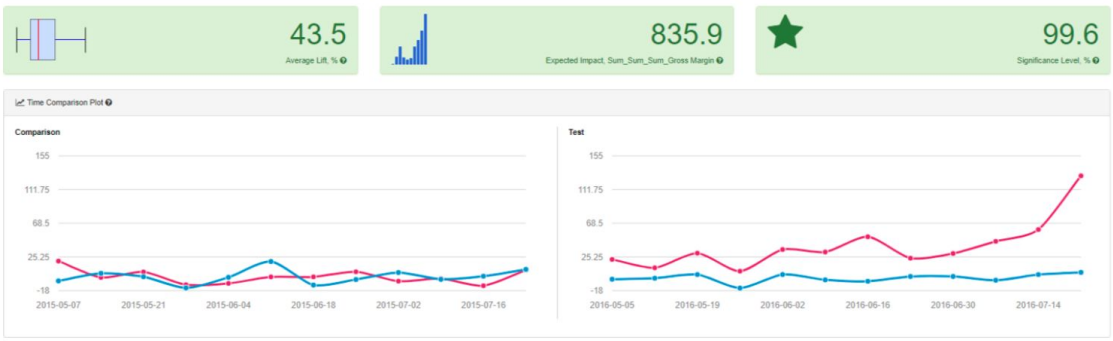
# STEP 4: Analysis and Write-up

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

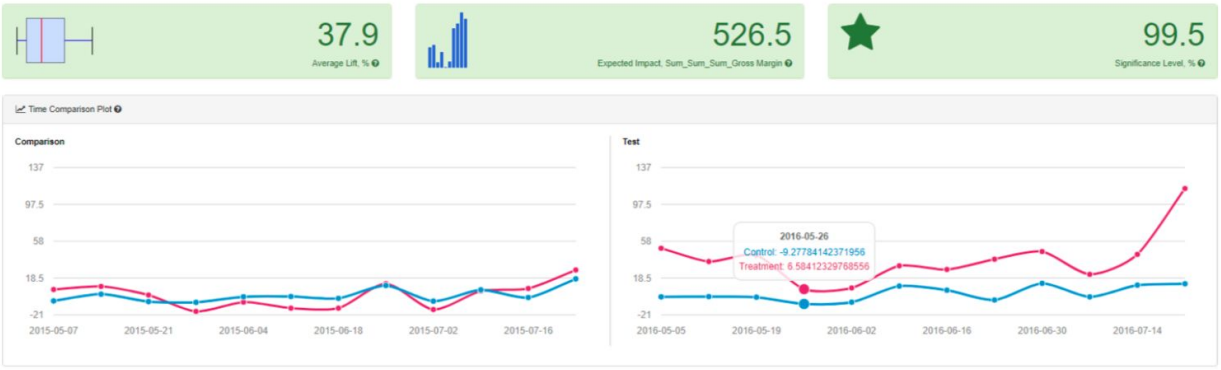
The company should apply its new menu to all it is stores as there is an increase in the profit.

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

For the Central region, the lift is 43.5% with a statistical significance of 99.6%.



For the West region, the lift is 37.9% with a statistical significance of 99.5% :




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

The lift of the new menu overall is 40.7% with a statistical significance of 100%.