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?

Ans: The performance metric is Gross Margin which will be used to evaluate the results of the test. As we need to predict if the menu changes impacted the overall profitability or not, we need to use the gross_margin as profit is represented through this variable. In this project we need to predict if the new updated menu will increase the profit growth of the stores. In order to find that we need to find the proper performance metric and compare other metric with it. Profit is represented as gross_margin in the dataset. That is why we need to take it as a performance metric in order to properly predict the profitability

2. What is the test period?

Ans: From 29th April 2016 to 21st July 2016.

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

Ans: Data need to be aggregated on weekly period.

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.

Ans: Control variables should be considered for this analysis are "Avg.MonthSales","Sq. feet" etc. In order find the significance if these values, we used correlation in order to compare between these variables and "Gross Margin".

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

metric?

Ans:

Pearson Correlation Analysis

Focused Analysis on Field Sum_Gross.Margin

	Association Measure	p-value	
AvgMonthSales	0.79036	0.000000	***
Sq_Ft	-0.01932	0.052101	.

Full Correlation Matrix

	Sum_Gross.Margin	Sq_Ft	AvgMonthSales
Sum_Gross.Margin	1.000000	-0.019320	0.790357
Sq_Ft	-0.019320	1.000000	-0.046967
AvgMonthSales	0.790357	-0.046967	1.000000

Matrix of Corresponding p-values

	Sum_Gross.Margin	Sq_Ft	AvgMonthSales
Sum_Gross.Margin		5.2101e-02	0.0000e+00
Sq_Ft	5.2101e-02		2.3119e-06
AvgMonthSales	0.0000e+00	2.3119e-06	

Figure 1: Correlation between Potential Control Variable and Performance Metric

From figure 1 we can see, “AvgMonthSales” have a very significant p-value of 0 (<0.05) however the “Sq_ft” p-value is > 0.05 and not significant.
From the correlation matrix table we can observe, “Avg.MonthSales” is highly correlated with “Sum_GrossMargin” as the rate is 0.79. The other control variable “Sq.Ft” is negatively correlated that means it is not highly correlated with the performance metric “gross_margin”.

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

Ans: The control variable “Avg.MonthSales” will be used to match 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	1964	7162
1675	7284	2214
1696	1863	7334
1700	7037	2014
1712	8162	7434
2288	2568	9081
2293	12686	9639
2301	12536	9238
2322	9388	3185
2341	2572	12586

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?

Ans: The company must roll out the updated menu to all the stores as the analysis showing significant growth.

2. What is the lift from the new menu for West and Central regions (include statistical significance)?
3.

Ans: From figure 2 we can see average lift as a result of updated menu is 47.6 for the Central region stores. That means the profitability will increase 47.6% per store per week or approximately $905.9 per store per week at a significance level of 99.6%. It looks like very much good increase in profitability from the previous menu.

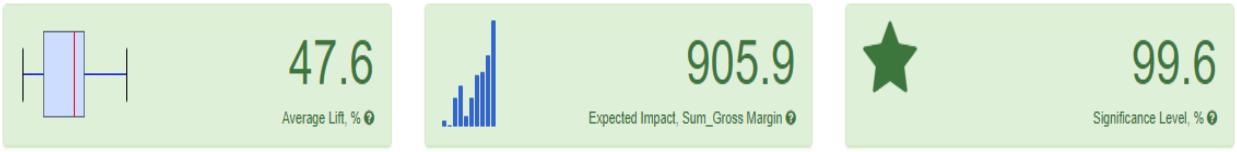

Figure 2: AB Analysis result for Central Region

From figure 3 we can see average lift as a result of updated menu is 39.1 for the West region stores. That means the profitability will increase 39.1% per store per week or approximately $530.2 per store per week at a significance level of 99.6%. Though the percentage of lift is lower than the stores in Central Region, it still looks like pretty good increase in profitability compare to the previous menu offerings.

In the project details it was written, at least 18% increase in profit growth needed compared to the comparative period while compared to the control stores. However, in both cases here for both Central and West region, the profit growth is as high as 47.6% and 39.1% respectively. So we should recommend new menu to be launched as it will result in significant profit growth in the future.

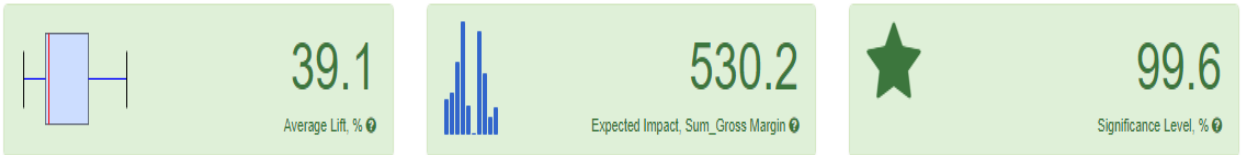

Figure 3: AB Analysis result for West Region

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

Ans: The overall lift of the new menu 43.35 that means means the profitability will increase 43.35% per store pre week. In the project details it was written, at least 18% increase in profit growth needed compared to the comparative period while compared to the control stores. We have much greater percentage than this par score. So we should recommend new menu to be launched as it will result in significant profit growth in the future

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.