



# Marketing Campaign Analysis

RevoU FSDA Week 2-3 Spreadsheet & Statistic Advanced Assignment

by Riadhi Nur Fajrina

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# OVERVIEW

# Background Overview



A fast-food company plans to add a new menu item. This company is still undecided about which of three marketing campaigns to use to promote the new product. The new item promotion is used at **several randomly selected locations**, and **sales are tracked for the first four weeks**.

As a Data Analyst, we were tasked with providing insights and recommendations to assist the company in determining which promotion was required for the new item.

# Core Business Problem



To determine which of the three potential marketing strategies has the greatest impact on sales.

To determine whether the campaign had an impact on the market size.

Escalate from insights to business recommendation.

# Dataset Overview

**Market ID**

Unique identifier for the market

**Market Size**

Size of market area by sales

**Location ID**

Unique identifier for store location

**Age of Store**

Age of store in years

**Promotion**

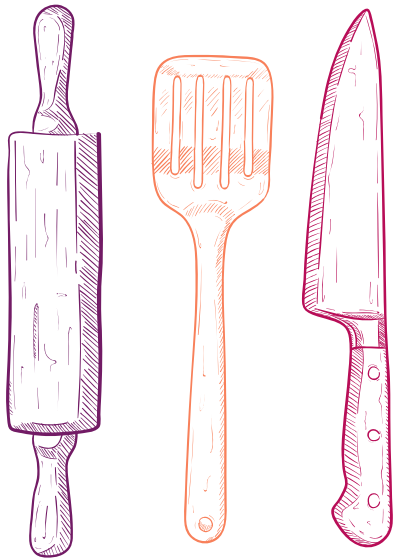
One of three promotions that were tested

**Week**

One of four weeks when the promotions were runs

**Sales in Thousand**

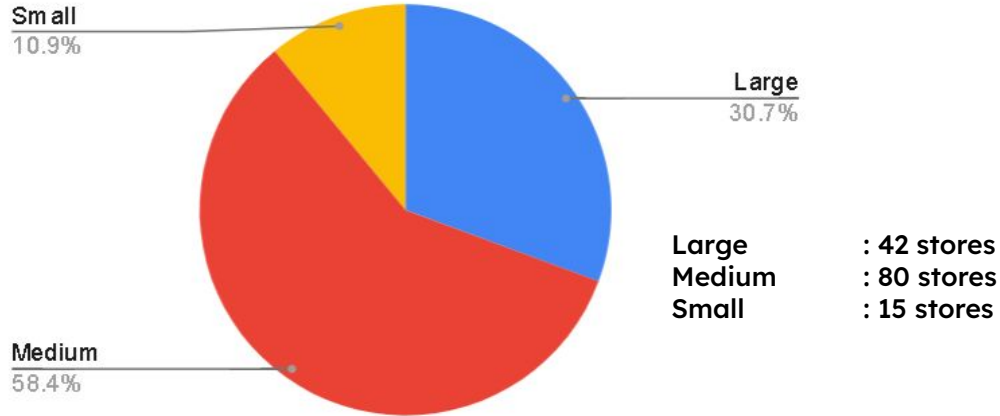
Sales amount for a specific LocationID, Promotion, and week



# MARKET CHARACTERISTIC

# Market Size Characteristic

Total Stores in Each Market Size

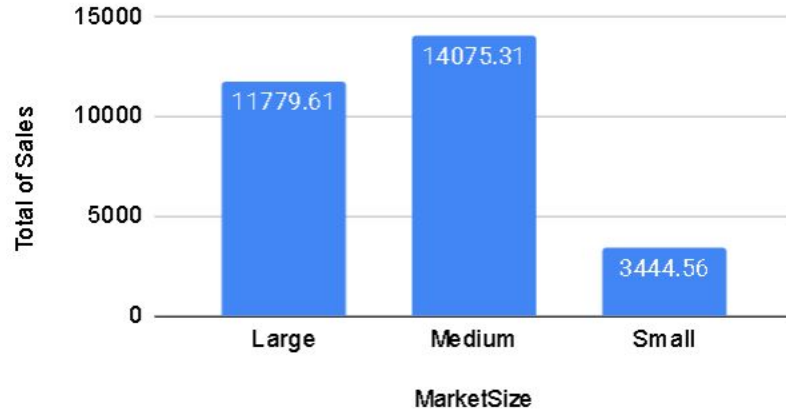


Medium Market Size has the most number of stores, while Small Market Size has the fewest.

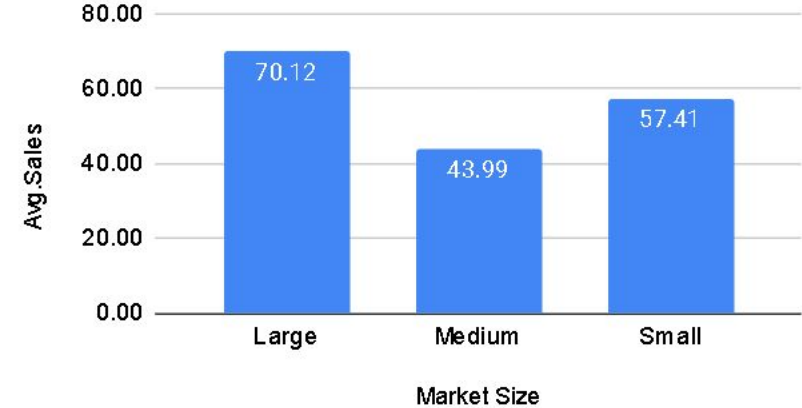


# Sales in Market Size Characteristic

Total of Sales in Thousands



Average of Sales in Thousands



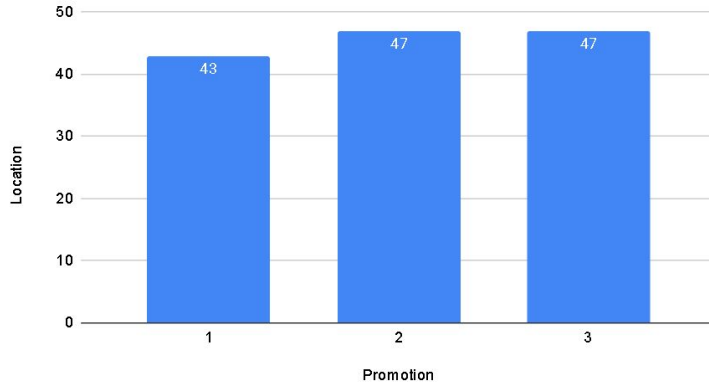
- Due to the huge number of stores, Medium Market Size generates the greatest amount of overall sales, in contrast to Small Market Size.
- However, Large Market Size has the highest average sales, while Medium Market Size has the lowest.



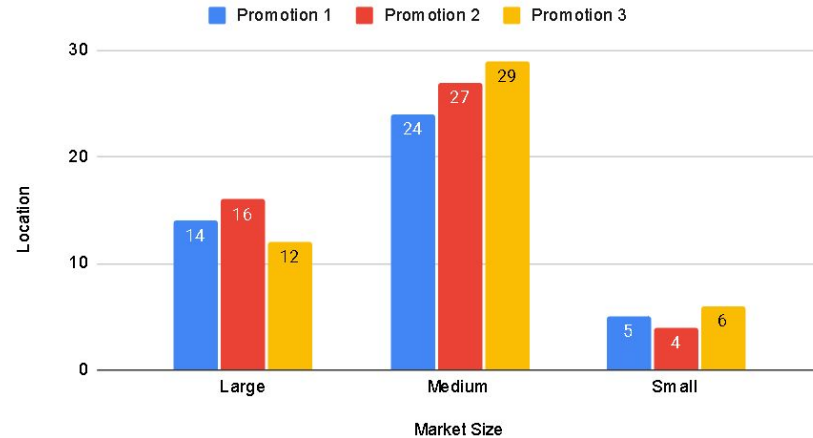
# PROMOTION EFFECT

# Promotion Characteristic

Count of each Promotion Conducted



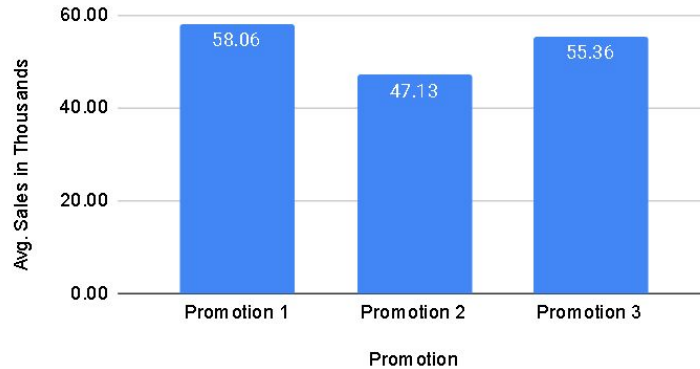
Count of Promotion in each Market Size



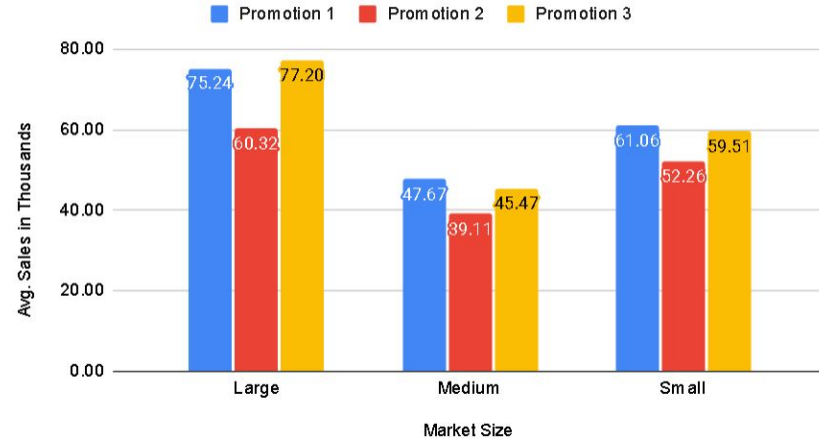
- Promotions 2 and 3 were tested in more locations than Promotion 3.
- Promotion 3 is mostly used in Medium and Small Market Sizes, with the exception of Large Market Sizes, which use Promotion 2.

# Sales per Promotion in each Market Size

Avg. Sales per Promotion



Sales per Promotion in each Market



- Promotion 1 has generated the highest average sales regardless of how few it was tested, while Promotion 2 has generated the least.
- Except for Large Market Size, Promotion 1 generated the highest average sales in every market.
- In each market, Promotion 2 generated the fewest average sales.

# Impact Between Promotion 1 & Promotion 2

Hypothesis:

H0 : Promotion 1  $\leq$  Promotion 2

H1 : Promotion 1  $>$  Promotion 2

T Stat  $>$  T Critical (6.43  $>$  1.65)

P Value  $<$  Alpha threshold (0  $<$  0.05)

**Reject H0**

Promotion 1 give higher impact than Promotion 2

t-Test: Two-Sample Assuming Unequal Variances

	Promotion 1	Promotion 2
Mean	58.09901163	47.32941489
Variance	274.0276885	228.2805146
Observations	172	188
Hypothesized Mean	0	
df	346	
t Stat	6.427528671	
P(T<=t) one-tail	0.000000000215	
t Critical one-tail	1.64926941	
P(T<=t) two-tail	0.000000000430	
t Critical two-tail	1.966843828	

# Impact Between Promotion 2 & Promotion 3

Hypothesis:

H0 : Promotion 2  $\leq$  Promotion 3

H1 : Promotion 2  $>$  Promotion 3

T Stat  $>$  T Critical (-4.88  $>$  1.65)

P Value  $<$  Alpha threshold (0  $<$  0.05)

**Accept H0**

Promotion 2 does not give higher impact than Promotion 3

t-Test: Two-Sample Assuming Unequal Variances

	Promotion 2	Promotion 3
Mean	47.32941489	55.36446809
Variance	228.2805146	281.1064944
Observations	188	188
Hypothesized Mean	0	
df	370	
t Stat	-4.881392711	
P(T $\leq$ t) one-tail	0.000000784653	
t Critical one-tail	1.648982255	
P(T $\leq$ t) two-tail	0.000001569306	
t Critical two-tail	1.966396124	

# Impact Between Promotion 3 & Promotion 1

Hypothesis:

H0 : Promotion 3  $\leq$  Promotion 1

H1 : Promotion 3  $>$  Promotion 1

T Stat  $>$  T Critical (-1.56  $>$  1.65)

P Value  $<$  Alpha threshold (0.06  $<$  0.05)

**Accept H0**

Promotion 3 does not give higher impact than Promotion 1

t-Test: Two-Sample Assuming Unequal Variances

	Promotion 3	Promotion 1
Mean	55.36446809	58.09901163
Variance	281.1064944	274.0276885
Observations	188	172
Hypothesized Mean	0	
df	355	
t Stat	-1.556022431	
P(T<=t) one-tail	0.06029688639	
t Critical one-tail	1.649157165	
P(T<=t) two-tail	0.1205937728	
t Critical two-tail	1.966668821	

# Promotion with Greatest Effect on Sales



Here is the conclusion based on the previous hypothesis testing results:

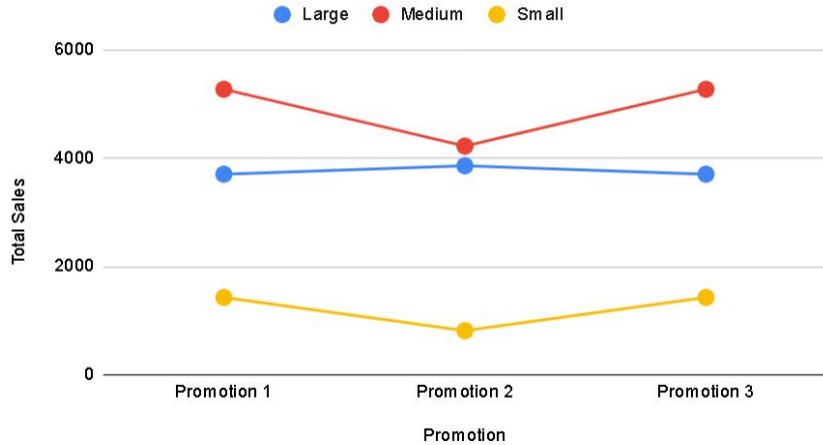
**Promotion 1 > Promotion 3 > Promotion 3**

Promotion 1 has the greatest impact on sales, followed by Promotion 3, and finally Promotion 2.

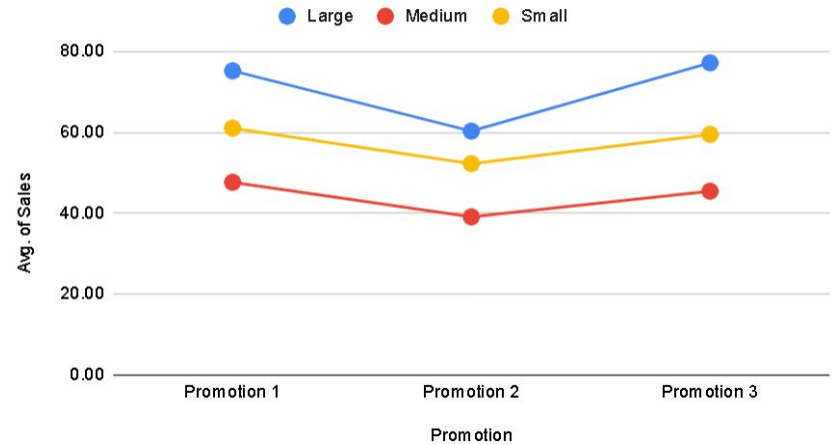


# Market Size & Sales Relationship

Total Sales for each Promotion



Avg. Sales of each Promotion



Different Market Sizes produced different Sales results for each Promotion.

# Sales per Promotion in each Market Size

Anova: Single Factor

## SUMMARY

Groups	Count	Sum	Average	Variance
Small	60	3444.56	57.40933333	43.99803006
Medium	320	14075.31	43.98534375	81.92745255
Large	168	11779.61	70.11672619	290.776009

## ANOVA

Source of Variatio.	SS	df	MS	F	P-value	F crit
Between Groups	76272.94507	2	38136.47254	268.913023	0	3.012259593
Within Groups	77290.33463	545	141.8171278			
Total	153563.2797	547				

Hypothesis:

H0 : Market Size has not an effect on sales.

H1 : Market Size has an effect the sales.

P Value < Alpha treshold  
(0 < 0.05)

**Reject H0**

The P value is 0 based on the hypothesis testing with Anova, indicating that Market Size has an effect on promotion sales results.

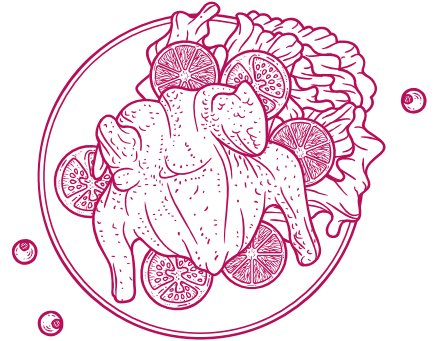
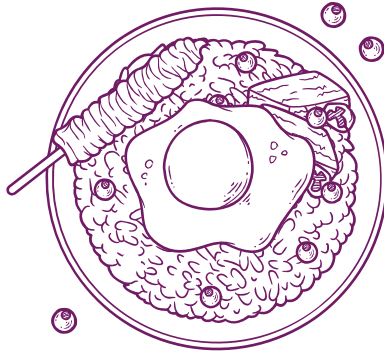
# Conclusion

- The Medium Market Size has the most stores (80 stores), while the Small Market Size has the fewest (15 stores).
- Medium Market Size has the lowest average sales, while Large Market Size has the highest.
- Promotion 1 produced the highest average sales regardless of how few were tested, while Promotion 2 produced the lowest.
- The Promotion's outcome was influenced by Market Size.



# Recommendation

The Promotion 1 is the most effective campaign strategy for the new item, because it has the greatest impact on sales in almost every market size.





# THANKS!

Feel free to comment below, DMs or reach me at  
[riadhigodjay@gmail.com](mailto:riadhigodjay@gmail.com) for any feedbacks or  
suggestion