**BANA 200: Foundations of Business Analytics**

**Starbucks Corporation Analysis**

**Assignment 2**

**Submitted by**

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**INTRODUCTION:**

The study is about the ratings of customers at Starbucks Corporation conducted in Orange County. This study would be useful to conduct some insightful analysis to help senior management understand more about how to improve customer engagement and profitability. In this study, as a first step, the dataset is prepared for analysis by cleaning it. The cleaned Excel file contains survey data on a random sample of 6,121 Starbucks Coffee customers that include zip code-wise ratings, income, and profits at each customer level. With the sampled data, it is understood that on average, a Starbucks customer gives a profit of $100.99 per month with the median satis100 rating of 55. It is also noticed that the customers who have given recommend a rating of 7 have given higher profits to Starbucks on monthly basis. Variables X1 – X22 are all measured on a 5-point scale (1 = terrible, 2 = poor, 3 = average, 4 = good, 5 = excellent). The same method is replicated for the column satis100 where less than 0 and greater than 100 are replaced with 0 and 100 respectively and for column recommend, values less than 0 and greater than 10 are replaced with 0 and 10 respectively. Using satis100, two new variables Fail and Exceed are created with the condition that the ratings below 20 are categorized as Fail and the ratings above 80 are categorized as Exceed. Another variable called City is created using the ZipCode of each customer to check the profits city-wise. The summary of the dataset is given below:

Text

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**Q1) Create two high quality graphs or charts.** **What interesting relationships do you see among the variables? What can you conclude? Based on these charts, what recommendations would you give to senior management?**

**Solution:**

**Graph 1:**

The below chart has been created using Excel. It is interesting to note that the customers who have given higher recommendation ratings have also given higher satis100 ratings which show that the customers recommended when they are satisfied with the Starbucks products. For example, as per the below graph, most of the customers who have given a rating of above 80 for satis100, have also given a recommend rating of 10. At the same time, there are a few customers who have given a satis100 rating of less than 20 but are still given a recommendation rating up to 5. To improve customer engagement and profitability of Starbucks, it is suggested that the customers who have given less recommend ratings are to be targeted with better deals.

**Graph 2:**

The average profit per customer stands at $100.99. The median profit stands at $101.19 which shows above 50% of customers give a profit of $101.19 and above. Nearly 45 cities in Orange County are sampled and some of the cities provide an average profit of less than $100 and those are the cities to be targeted with better deals. In the above graph, it is to be noticed that the cities on the left side from Dana point at the bottom to up to Stanton must be targeted with better deals. It can be **free coffees every bi-weekly** or an **improved version of the star for the day campaign**.

**Q2a) Do the three predictor variables do a good job of predicting the average monthly profits of each customer? Comment on the p-values and the R2 value, and interpret the meaning of the R2 value in this context.**

**Solution:**

Table

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The predictor variables Satis100, Income and Recommend are doing a good job of predicting the profits for Starbucks. It is evident in the R-squared value and P-values for each variable. R-squared measures the goodness of fit of a regression model. Hence, a higher R-squared indicates the model is a good fit while a lower R-squared indicates the model is not a good fit. The R-squared value stands at 0.907 which proves that the model has better explanatory power in predicting the profits. The lower the P-value the better the confidence of the correct prediction. All the variables are important in predicting the profits which are evident from the P-values less than the significance level (assume 0.05) hence we conclude that there is a linear relationship between independent and dependent variables. It indicates that these variables can predict the profits more than 99% correctly.

**Q2b) For each 10-point increase in satisfaction (e.g. for a 10-point increase in satis100), by how much do we expect the average monthly profits to go up by? Round your answer to two decimal places and comment on whether you feel like this is a big increase in average monthly profitability or not.**

**Solution:**

With every unit increase in satis100, there would be an increase of $0.238 in the profit of each customer on a monthly basis. It means that a **$2.38 increase in profit for 10 units increases in satis100, per month for each customer**. For example, if Starbucks has 1,00,000 customers, there would be an increase of $2,38,000 per month which is a very big increase.

**Q2c) Calculate the predicted average monthly profits for a customer with satis100 = 77, recommend = 8, and Income = $121,500. Report this predicted profit value below rounded to two decimal places.**

**Solution:**

Equating the given values in the model developed, the predicted average monthly profit is calculated to be **$124.81.**

**Q3a) How many customers in the dataset is Starbucks failing to meet customer expectations? That is, report the number of customers where satis100 < 20.**

**Solution:**

About **165 customers** arefailing to meet customer expectations.

**Q3b) How many customers in the dataset is Starbucks exceeding customer expectations? Report the number of customers in the dataset where satis100 > 80.**

**Solution:**

About **495 customers** exceeded customer expectations.

**Q3c) Comment on the regression coefficients for the dummy variables “exceed” and “fail”. What seems to have a bigger impact on profitability: Failing to meet customer expectations or exceeding them? Report the expected change in profits when Starbucks exceeds customer expectations (exceed = 1) vs. when Starbucks fails to meet customer expectations (fail = 1) and comment. What advice would you give to senior management?**

**Solution:**

This analysis was performed on the dataset with fail and exceed as the two new variables including income and recommend variables.

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By looking at the regression co-efficient of fail and exceed, it is understood that failing to meet customer expectations has more impact on profitability than exceeding them. When Starbucks exceeds customer expectations, there is an **increase in profit of $2.678** whereas there is a **decrease in profit of $13.067** when Starbucks fails to meet customer expectations. A personalized targeting of customers is required for those fail cases. **Seasonal Discounts, Seasonal combo offers, on-time delivery of orders, and doubling the rewards** could increase the profit of Starbucks.